



# ICOM 2021

## ZERO WASTE MANAGEMENT CIRCULAR ECONOMY

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**Hana Stojanová,  
Helena Chládková (eds.)**

10<sup>th</sup> International Conference on Management

# **Zero Waste Management and Circular Economy**

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Czech Republic**

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**Stepan Vashkevich** is a specialist in circular economics, with the particular focus on circularity in the textile industry based in Czech non-profit organization Institute of Circular Economy. Key areas of his expertise are material flow analysis and its implication for policymaking, advisory on the application of the principles of circular economy for public and private sector and education. He is engaged in editorial work, in the past he also led the first Czech circular news website Zajimej.se.



**David Brož** (1992) is a Ph.D. student at the CULS in Prague. He runs agriculture farm with special crops as silybum marianum, poppy and and cumin. He is also providing agricultural consultations. He is the president of the The Young Agrarians Society of the Czech Republic, which has approximately 450 members. David Brož participates in working groups in the EU as civil dialog groups, is an adviser to the Minister of Agriculture Miroslav Toman, a member of several committees at the Ministry of Agriculture. As part of his portfolio of activities, he is actively involved in the issue of circular economics, especially in the field of biowaste management - mainly in the field of agriculture. It operates facilities for the collection of this waste from municipalities. As part of his grant activities, he is the solver of several internal CULS grants, the Horizon 2020 project, Erasmus + and the Visegrad fund.



**Nataša Foltánová** began her career in Canada, where she also studied international trade. After graduating, she worked for several years as a buyer on an African construction project. After returning to the Czech Republic, she was involved in the creation of multiple mini-breweries. In 2008, she founded Tierra Verde, a manufacturing company for ecological cleaning products. From Tierra Verde, which, according to her own words, was created directly in her kitchen, she managed to build a company with 100 million CZK turnover. Tierra Verde is an example of sustainable business responsible towards nature. The concept of zero-waste can be found in every process of this company. She left Tierra Verde in March this year. What will be her next project?

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## **SECTION 1:**

### **Social Responsibility and Sustainability**

## A CONTENT OF HEAVY METALS IN E-WASTE: A COMPARATIVE STUDY OF VARIOUS LIGHTG SOURCES

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**Abstract:** Demand for light sources increases with the increasing energetic, technologic and economic requirements of society. The lifetime hours of lamps are longer; however, such a waste still makes up a portion of waste production. The content of toxic metals is one of the factors that influences the environmental impact during their life cycle. Discharged light sources are separated, recycled or disposed. The sorted material can be reused as a secondary raw material, or the waste can be energetically recovered in an incinerator. One of the most disadvantageous options is landfill deposition. The separated fractions of such waste can be reused in terms of lowering the amount of waste and enhancing the circularity. Although compact fluorescent lamps and LEDs are energetically more convenient, their material requirements are more demanding.

**Purpose:** The aim of the study, was to evaluate the heavy metal composition regarding environmental factors, considering the lifetime hours and luminescence.

**Design/methodology/approach:** The content of heavy metals of fluorescent lamp, LED lamp and incandescent light bulb was studied using the XRF analyser. The illuminance of the light sources was measured by a lux meter.

**Findings:** Based on the results, the LED light sources seem to be the most convenient. From the analysis, these light sources contain the lowest amount of copper and lead, also from the perspective of the lifetime hours and already existed collecting system.

**Keywords:** light sources, heavy metals, X-ray fluorescence, LED, CFL, the incandescent lightbulb

### Introduction

Light sources, as energy-related products, figure with a significant potential regarding lowering environmental impact and have a positive achievement in energy. According to the EC directive 2009/125/EC, there are certain parameters to be followed to improve their life cycle impacts on the environment (Directive EU). Due to the directive requirements, gradually manufacturers and consumers have been converting from incandescent light bulbs to compact fluorescent lamps (CFL) or light-emitting diodes (LED). These can use 70 % to 85 % less energy compared to incandescent light bulbs. Their lifetime represents 10 to 50 times longer period (Lim et al., 2012). Annexe 1 of the European directive sets, among others, expected parameters in terms of waste generation, material recovery and pollution in each environmental element, such as soil, water or atmosphere.

In the Czech Republic, light sources undergo regulation 542/2020 Sb. dealing with a takeback waste collection. In 2019 the number of electronic products

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undergoing takeback system was 236 297 tons, whereas the amount of those that were recollected was 101 319 tons. These numbers represent all types of electronic devices, where light sources take their part too (Cenia, 2019). According to one of the biggest recycling companies in the Czech Republic, Ekolamp, in 2020 there were 587 tons of light sources handed over for recycling. From these 93 % was materially recovered. The total amount of municipal waste produced in 2019 was around 5,76 million tons. This waste includes the waste from a separate waste collection system (Cenia, 2019). Recycling is based on a volunteer action, although every consumer pays for recycling via purchase price. Several legislation documents and policies have been applied in terms of lowering the energy consumption regarding the environmental impact and climate change, such as the Directive 2009/125/EC of requirements for eco-design or the European Regulation 2017/1369 of eco-labelling or the Directive 2012/19/EC on waste electrical and electronic equipment.

In Europe, light consumption in households represents around 20 % to 30 % of the overall domestic consumption. Compact fluorescent lamps (CFL) represent a light source that has a longer lifetime cycle and consumes less energy than the equivalent of the incandescent bulb. These light sources have been replacing the incandescent and halogen light sources because of their higher capacity to fulfil the EU targets set up for energy consumption (2005/32/EC). However, the number of hazardous components, such as toxic metals mean a possible threat, when being disposed improperly, mainly as a part of municipal waste being disposed at the landfill. Moreover, the recycling and copper recovery not only from incandescent light bulbs, can contribute to the primary ore conservation and save up to 85 % of production energy, therefore decrease the negative environmental impact of production processes (Isildar et al., 2018). In the case of a function, 100 W incandescent lamp can be represented by 23 W CFL, which lasts 8 to 10 times longer period and consumes from 2 to 5 less energy power (Khan et al., 2011).

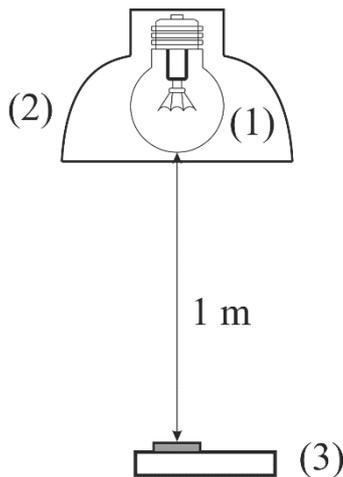
In developed countries, 40 % of electronic waste that includes light sources, ends up in landfills. In some countries, e.g. Iran, certain light sources become a part of a municipal waste stream (Taghiopur et al., 2014). According to Ghosh et al. (2015) illegal sites can contain 100 times more heavy metal or polycyclic aromatic hydrocarbon pollutants (Cucchiella et al., 2015; Gosh et al., 2015).

In general, recycling electronic waste represents a strategy to support environmental protection by proper disposal and thus avoiding contamination. Waste from LEDs and CFLs has a higher potential risk in human health effects and impact on the environment while being disposed. Therefore, this study aims to compare different types of light sources from the perspective of the content of heavy metals and illuminance.

## **Methodology**

For the purpose of this study, three types of light sources were used: incandescent light bulbs, compact fluorescent lamps (CFL) and light-emitting diodes (LED). LEDs and CFL were claimed to be equivalent to 100 W incandescent light bulb by

the producer. Three samples of each type of light sources were homogenized and prepared for X-ray fluorescence (XRF) analysis. Parameters such as luminescence and heavy metal content were measured, using lux meter Tesla PU150 and XRF analyser Niton XL3t Gold+, respectively. Also, lifetime hours and economic aspects were considered. The lifetime hours of CFLs and LEDs presented by the producer were 8 000 and 25 000 hours. For this study, household conditions were taken into account and the used XRF analyser was calibrated by a producer. The samples of each light sources were measured three times. Fig. 1 describes the measurement of illuminance. A lightbulb was placed in a table lamp at a height of 1 m, with incident rays pointing down to the lux meter.



**Figure 1.** The principle of illumination measurement, where the table lamp was used to imitate the office environment.

(1) studied light source, (2) lamp-shade and (3) lux meter.

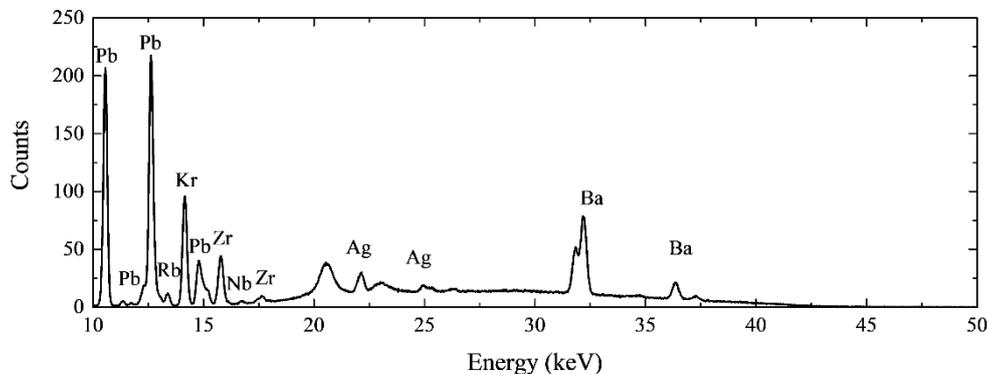
## Results and discussion

The content of heavy metals determined from the XRF measurements (see Fig. 2) is presented in Table 1. These results show, that even though the incandescent lightbulbs contain the lowest amount of copper, considering the lifetime hours of one LED vs. lifetime hours of one incandescent bulb, disposing one incandescent lightbulb would produce 0,129 g of Cu, whereas one LED, lasting the same time would produce only 0,012 g of copper waste. From this point of view, LED light sources seem to be more convenient. Another advantage is the price when equivalently one LED is cheaper than equally time lasting classic incandescent bulbs. The same occurs in the case of CFL light sources when the amount of Cu rises to 2,62 g comparing with one LED. Similar contents of copper were compared in the study by Zamprogn Rebello et al., (2019), where the authors claimed Cu to be the second most abundant metal analysed in LEDs and CFLs, after aluminium. Copper is represented from 0,021 % to 0,031 % in LEDs, which is the amount, comparable

only with the incandescent light bulbs from the analysis. CFLs were claimed to contain from 0,0005 % to 0,111 %. The differences may be caused by a different way of leaching Cu from a sample, a method of analysis, but also the research does not provide information about power consumption (Zamprogno-Rebello et al., 2019).

The highest amount of Pb was analysed in the incandescent light bulb. Since Pb is an element that occurs in the environment naturally, the higher levels can be caused by e.g. old plumb systems, mining or industrial activities. Leaded fuels are decreasing in their use, but their remains are still detectable in certain sites. Its occurrence is detected up to 8 inches in soil and since it is naturally immobile and accumulates in biological systems, elimination of Pb without direct remediation means a long-term environmental exposure (Tangahu et al., 2011).

In the case of Pb, the other factors might determine the choice of light source one can use. One of the factors may be energy, which can be lowered by the uptake but also other material demand such as aluminium or gallium. Comparing LED and CFL light sources, LEDs are 40 % more energy-efficient and mercury-free. From this point of view, it is more convenient to consider LED usage (Liu et al., 2020)



**Figure 2. An example of the XRF spectrum of the incandescent light bulb**

The measurement of illumination shows that the results for CFL and LED are consistent with each other, within the errors. However, the results in the case of incandescent lightbulb show, that the illumination is significantly higher than in the case of the other light sources using in this study. These discrepancies could be caused by the bulb shape, and also due to the values did not match the information on the package. The second reason could be explained by the different techniques of photometric quantities.

**Table 1. Results of measuring the lighting sources**

Power consumption	Lifetime hours	Illumination [lux]	Weight of the light source [g]	Content of Cu [ $10^{-1}$ %]	Content of Cu <sup>1</sup> [g]	Content of Pb [ $10^{-2}$ %]	Content of Pb <sup>1</sup> [g]
Incandescent lightbulb 100W	1000	320±32	28.61±1.42	0.18±0.024	0.129	76.4±4.7	5.463
CFL 21W	8000	200±20	77.29±1.33	11.30±1.37	2.620	3.5±0.053	0.081
LED 11W	25000	165±17	35.18±0.15	2.78±0.365	0.098	3.3±0.1	0.012

<sup>1</sup>This value is equivalent to 25 000 lighting hours

## Conclusion

The study was focused on the comparison of different types of light sources from the perspective of the content of heavy metals. The main results could be summarised as follows:

- The results show, that in the case of Cu, the compact fluorescent lamps contain the largest amount of this metal, with respect to lifetime hours. In the case of Pb, the highest content was analysed in incandescent lightbulb waste, also considering the lifetime hours.
- The measurement of illumination shows that the results for CFL and LED are consistent with each other, within the errors. On the other hand, the results in the case of incandescent lightbulb show, that the illumination is significantly higher than in the case of the other light sources used for this study.
- From the point of view of the consumer, the CFL are in retreat, mainly due to its recycling is laborious and costly.

Based on the presented results, it can be concluded, that the LED light sources seem to be the most convenient. From our measurement, these light sources contain the lowest amount of copper and lead. Considering their lifetime hours, the amount of waste should be the lowest, also incandescent lightbulbs happen to be a part of municipal waste, whereas the separate collection system for CFL and LEDs has been already set up. LED sources can be also collected separately from other light sources, with electronic waste.

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## A NEW TYPE OF RENEWABLE ENERGY SOURCE DERIVED FROM FORESTRY

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### Abstract:

In forestry, dendromass for energy purposes can be obtained in the form of firewood. Alternatively, it can be sourced as so-called logging debris, which remains in the forest after logging trees, among other things, as stumps or roots. Stumps and roots are difficult to transport and contain a large proportion of soil and stones. One of the possible ways of stump extraction is with grubbing heads.

Therefore, a new prototype of a grubbing head has been developed and it will be used to obtain logging waste from forest clearance areas. The advantage of this grubbing head is that it is possible to move the stump after it has been torn out, so that the soil is separated from the stump. The surface is then adjusted and aligned with the head. With the help of the excavator boom, parts of the stump are stored in piles, from which they are transported to the dendromass storage. After reaching 30% moisture, they are pulverized into energy chips, which are then taken to an incinerator or power plant. The resulting wood chips have an optimal calorific value and are presented as a renewable energy source produced from logging debris.

After processing all the data, which are based on several field measurements undertaken, the average processing time of one stump was found to be three minutes. In one hour, an experienced operator is able to process up to 20 stumps on average.

**Key words:** dendromass, grubbing head, logging debris, renewable energy source, woodchip

**JEL Classification Codes:** O13, O30, Q23, Q42, Q50

### Introduction

The current situation regarding the so-called bark beetle calamity offers consumers a large amount of wood in the form of firewood. However, after the cutting down of these "bark beetle" mature trees, large forest clearing areas often remain, on which there is a large amount of unused wood mass in the form of stumps and roots, which would rot in a few years. However, it is not advisable to leave stumps for gradual decomposition, as wood-destroying fungi may occur in some localities, in which the rot is transferred to the root systems. There would be a risk that new plantings on regenerated areas would be infected with this fungal pathogen from the beginning. Therefore, it is desirable to use this wood material for further processing. One of the possible ways to extract this wood waste is with grubbing heads.

For this reason, a new prototype of a grubbing head was developed at the Faculty of Forestry and Wood Technology of Mendel University in Brno, which will be used to obtain this wood material. This is because we can obtain dendromass from forestry not only in the form of firewood, but also as so-called logging debris, which remains in the forest after logging in the form of branches, cuttings, stumps or roots. We

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estimate that stumps on an area of at least 1,000 ha could be grubbed up annually in the Czech Republic, which, with a stock of stump wood of approx. 50 m<sup>3</sup> / ha, represents an annual source of approx. 50K m<sup>3</sup> of stump wood.

## Literature review / Research Background

Logging creates numerous clearing areas in the middle of the involved stands (HUNTER et al. 1999, p. 2). On such clearing areas, there is a lot of so-called logging debris in the forests, which could be used to produce heat. After main felling, 35 to 40% of the dendromass produced + bark remains in the forest without direct benefit, 10% for conifers and 15% for deciduous trees. Thus, about 50% of the dendromass produced is removed from the forest. Almost the same amount in the form of bark, stumps, roots, branches, tree tops and assimilation organs remains in the forest stands (Simanov 2008, p. 33).

Dendromass from forestry can be used for energy by direct combustion without its dimensional adjustment, or in the case of wood, after cutting, splitting, chipping or crushing (Neruda et al. 2015, p. 201).

However, stumps and roots are obtained by grubbing up underground parts of trees (Neruda et al. 2015, p. 217). Until recently, grubbing-up was common in the Czech Republic only in some forms of forest management, or in the case of deforestation. Currently, there is an effort to use this secondary source of biomass, which will arise after tree felling, for energy purposes. Technologies are also being developed that are able to process this material efficiently.

The most common way of stump extraction in the Czech Republic is to grub them with a bulldozer blade. After grubbing-up, stumps are usually folded by bulldozers into ramparts or terrain depressions, in which they are left to disintegrate naturally. Locally, the so-called "burial" of stumps is also carried out, during which a ditch is excavated and into which the stumps are piled up and covered with soil (Neruda et al. 2015, p. 217). The disadvantage of this system is the non-usage of wood for further processing.

A very important feature of a dendromass intended for energy utilization is its calorific value and the associated moisture. In general, it can be said that with increasing moisture of biomass, its calorific value decreases and vice versa. It is due to the fact that the heat generated by combustion is consumed during the evaporation of the water contained in the biomass (Simanov 1993, p. 116).

Forest dendromass always contains at least 10% water. Freshly felled wood has a moisture content of 40 - 60%, so it is necessary to let it dry for at least 2 years. This brings it to a value of 15 - 20%, which is much more advantageous for combustion (Pastorek et. al. 2004, p. 286).

When burning wood from standing trees, a larger part of energy is used to dry it out than with other fuels. Because wood moisture has a large range, its effective calorific value also has a large range (Neruda et al. 2015, p. 210). The same is true when burning stumps or roots. Therefore, it is recommended to allow this organic material to dry before using it, for example in incinerators.

## Methodology

Operational tests of the prototype grubbing head were carried out at location LZ Boubín, Lesy ČR, s.p. in November 2020. The grubbing head was mounted as an adapter for the boom of the JCB 220 crawler excavator and was controlled by remote control from the excavator cab.

The stump was first cleaved in the soil with the help of a cleaving arm of the grubbing head and pulled out of the ground in parts to a height of about one meter. During the subsequent position of the head above the ground, the soil and stones, which were located on the cut stump or between the root system, were released. The advantage of this grubbing head is the possibility to move the stump, or its parts, after being pulled out of the subsoil, until the soil and other undesirable materials are separated from the pulled stump. The soil fell into the space where the stump was torn out, and with the help of the bottom part of the head body, the surface was subsequently adjusted, leveled and compacted. This operation cannot be performed when using other types of grubbing heads.

With the help of the excavator's hydraulic boom, parts of the stump were then stacked. The number of the piles and the distance between them were mainly determined by the reach of the boom of the used excavator, which carries the grubbing head. During the operational tests, the distance between the piles was about 12 meters.

The last operation occurred during the transport of parts of the stumps by a modified tractor vehicle, which transported this logging waste from the created piles from the clearing area to the dendromass repository. They were stored there until their moisture content reached 30%.

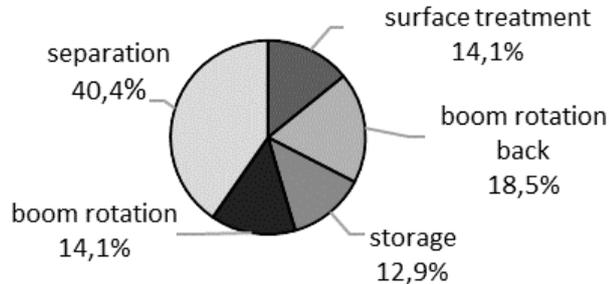
After reaching this value, with the help of crushers, they were pulverized into energy chips. It was then transported in containers to the incinerator as a renewable energy source, which has an optimal calorific value and is produced from forestry.

## Results

After completion of the operational tests of the grubbing head prototype, during which a sufficient statistical set of ripped out and cleaned stumps were left in the clearing following stump extraction of Norway spruce, the average time spent on one torn and cleaned stump was recorded as 1 min 21 s. One stump is defined as the remaining stump: the part of the trunk that remained rooted in the ground after the tree was felled. Using existing techniques and technology, this process would not currently be possible, even if the stumps were not cleaned of soil and similar unwanted material.

After processing all data providing real values, which are based on several field measurements, the average processing time of one stump, including the treatment of the subsoil after extraction and moving the excavator to the next stump, was found to be three minutes. In one hour, an experienced operator is able to process an average of up to 20 stumps occurring on the clearing. A more detailed percentage distribution of individual work operations spent on processing one stump, which

occurs after logging, is presented in Figure 1. In our measurement, stumps were torn out, the diameter of which ranged from 15 to 80 cm, while the diameter of the stump did not significantly affect the time needed to tear them out. The soil, the number of stones in the root system and the level of experience or training of the operator had a significant influence on the processing time of stumps, both for the actual handling of the excavator and for the handling of the adapter in the form of a grubbing head.



*Figure 1. Percentage distribution of individual operations during stump grubbing*

## Discussion

Although in the Czech Republic, stump extraction for energy purposes is currently an almost unused process, which could also reduce the cost of subsequent preparation of the clearing for reforestation (Eriksson, Gustavsson 2008, p. 2), in Finland, the grubbing-up of stumps and coarse roots has been gradually increasing since 2000. In 2010, the increase in the extraction of this logging waste was approximately 20% compared to the previous year. (Ylitalo 2011, p. 139).

Although stump extraction was identified in the 1930's as one of the most promising technologies in the forestry sector for securing the supply of solid biofuels (Lazdiņš, Zimelis 2012, p. 1), Stupavský et al. (2008, p. 32) claims that logging residues are still a little - used source of renewable energy, with the exception of the Scandinavian countries. This opinion is shared by Melin et al. (2010, p. 1) and Alam et al. (2012, p. 1), who agree that in Finland a large part of the current forest harvest for energy from dendromass represents residues after harvest, i.e. the tops of trees, branches, leaves, but also stumps and strong roots. In Latvia, by contrast, forest dendromass is becoming increasingly important for forest owners and the forestry industry. In Latvia, post-logging waste is used to produce biofuels and has become a widely accepted technology in both public and private forests. (Lazdiņš, Zimelis 2012, p. 1). According to von Hofsten (2006, p. 5) Norwegian spruce is the main tree species in the Scandinavian countries and it is the focus of stump extraction. At the same time, he states that the methods used for stump extraction in 2006 remove the above-ground part of the stump as well as coarse roots with a diameter of more than 5 cm. This results in a recoverable stump biomass consisting of 32% aboveground stump wood and 68% root stump wood (Hakkila 1975, p. 14).

Stumps consist of wood and the bark of a harvested tree. Extraction is carried out with heavy machinery after tree felling. Usually excavators are used, which are equipped with special teeth for stump extraction, which can divide the stumps into smaller pieces. The harvested wood mass, which is obtained from stumps and roots, represents 23-25% of the biomass of the trunk wood in both spruce and pine (Eriksson, Gustavsson 2008, p. 1). Alam et al. (2012, p. 1) report that in mature forests, stumps and strong roots represent about 25-30% of the total tree biomass. A year later, the same author published that it was found that stump and root extraction can increase total biomass production (energy biomass and trunk wood) by approximately 21-36%. (Alam et al. 2013, p. 12).

The amount of stumps and strong roots available on the clearing after harvesting depends on the type of forest management. These have a significant impact on the growth rate and further development of forest stands (Renshaw et al. 2009, p. 11). In order to obtain more sources of biofuels from forests, stumps are sometimes harvested after felling (Ranlund, Victorsson 2018, p. 1). Stumps and their strong roots are becoming an important as a source of bioenergy due to growing concerns about climate change. For instance, in Sweden it is estimated that stump extraction could replace 2.5-5% of the energy currently obtained from fossil fuels (Victorsson, Jonsell 2016, p. 1). The same opinion is shared by Björheden (2006, p. 1), who argues that the utilization of bioenergy through logging waste, which will remain on the clearing after tree felling, is growing due to concerns about climate change and the growing demand for bioenergy.

The energy content of stumps varies in different studies (Lazdiņš, Zimelis 2012, p. 1). According to studies in Finland (Hakkila 2004, p. 98) approximately 140 to 160 MWh/ha can be obtained. Tekes corporation provides 200 MWh/ ha (Tekes 2004, p. 2). Von Hofsten (2006, p. 3) believes that stump extraction has the potential to produce 5-10 terawatt hours (TWh) per year.

## Conclusion

The results show that the use of this new prototype of a grubbing head represents a fast and harmless way of obtaining so-called logging debris in the form of stumps and roots that remain in a clearing after logging. This extracted waste will not be left on clearings for gradual decay, but will be used as a renewable energy source that can be used in heating plants or incinerators. Also the surroundings around the torn-out stump will be minimally disturbed and after the tear-out with the head will be modified. The stump extraction will thus enable a fully mechanized restoration of forest clearings, which will be free of "stump obstacles". Additionally, in premature stands where the frequency of stumps is higher, it will bring new economic opportunities with a link to extensive calamity logging in all forest stands.

Directive 2009/28 / EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources sets a target for the European Union as a whole to achieve a 20% share of energy from renewable sources in final energy consumption by 2035. One way to meet the target for forestry is to secure a new source of renewable energy by extracting stumps and roots in an

economic and environmental way. One of the significant obstacles to the development of bioenergy projects in the conditions of the Czech Republic is the current high costs of heat production from biomass compared to fossil fuels. The utilization of tree stumps is one of the possible alternatives to additionally mobilize the unused potential of these types of sources of high quality energy chips.

This article contains partial results because the research is still ongoing. Further results will be supplemented and commented in another subsequent article, after the end of the research.

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# A SENCE OF SAFETY AS AN ELEMENT OF MEDICAL WORKERS RELATIONS MANAGEMENT DURING THE COVID-19 PANDEMIC

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**Abstract:** Ensuring a sense of safety at the place of work is definitely one of the priority aspects of managing medical workers in a crisis situation formed as a result of the COVID-19 pandemic. Furthermore, care for good employee relations is a special challenge for the managerial staff, taking into consideration the intensity of stress and possibility of conflicts.

**Purpose:** The aim of the article is to present the views of medical personnel on their sense of safety at work during the COVID-19 pandemic as an element shaping relations among employees.

**Design/methodology/approach:** The study was carried out in December 2020 on a representative sample of Polish medical workers. It focused on learning their opinions on functioning in the workplace in the conditions of the COVID-19 pandemic. The research was conducted using the CATI method.

**Findings:** Research results show relations between the sense of safety at work of medical personnel and relations among employees during the COVID-19 pandemic.

**Research limitations:** The COVID-19 pandemic situation, affecting organizations and society, is unprecedented due to its increase, resources or solutions involved, and the lack of existing literature.

**Practical implications:** The presented research results emphasized the importance of the sense of safety at work during the COVID-19 pandemic and also indicated the important role of the human resource management in shaping good relations among employees in this crisis situation.

**Key words:** COVID-19 pandemic, employee relations, human resource management, management in healthcare units, sense of safety at work

## Introduction

Resulting in a global crisis, the COVID-19 pandemic set up unprecedented challenges for employers and employees all over the world and the human resource management as well. It is without a doubt that this event constitutes an especially difficult test both in terms of executing the tasks carried out so far, and solving new and complex problems.

Changes in managing organizations and people employed in them affected also the health service sector. Managing medical workers in the face of dangers caused by the pandemic is presented as an interesting research field concerning recent issues (see Kröger 2020, pp. 156-158). Many articles have been devoted to the functioning of medical workers who represent the healthcare systems of various countries (compare Iyengar et al. 2020, pp. 943-946).

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The aim of the article is to present the views of medical personnel on their sense of safety at work during the COVID-19 pandemic as an element shaping relations among employees.

This study contains the results of research concerning selected aspects of human resource management in health care units during a crisis related to COVID-19. In particular, two important issues were analysed: sense of safety in the workplace and employee relations in the organization. The sense of safety falls into a subjective category, and regardless of the type of organisation that employs healthcare professionals commonly exposed to contact with infected or diseased individuals, we feel entitled to compare their opinions (Bostan et al., 2020; Rind et al., 2020; Monterrosa-Castro et al. 2020). A particular role here is assigned to the employer who creates working environment and comfort through organisation and availability of specific measures and information. Due to the risks associated with the performance of work by medical workers during a pandemic, ensuring safety and supporting good employee relations is one of the most important activities of the management staff.

### **Research Background**

Human resources are the organization's resources in terms of the knowledge, skills and motivation of its employees. However, they can't be equated with the number of people employed because they involve the potential that employees bring to the company. In other words, these are broadly understood competences of the staff that enable the objectives set to be achieved (Wang, He, Mahoney 2009, pp.1265-1285; Sousa, 2017, pp. 395-402).

Today, due to numerous technological and demographic and social changes in the aspect of work, the employee's competence profile is changing and, as a result, the requirements for managers are changing (Robak 2020, pp. 14931-14939). The effectiveness of employees is influenced, among other things, by their attitudes, knowledge and skills, but also by the relationships between individual team members. In the light of the foregoing, the manager's person and competence are of particular importance (Robak 2018, pp. 521-526; Robak 2019, pp. 157-170). Effective communication and positive contacts with employees, shaping attitudes conducive to team integration and openness to others and cooperation in the implementation of tasks, are important in directing. Due to the increasing complexity of work and new organizational and economic dependencies, professional work can rarely be done individually. In the working environment, therefore, a specific arrangement of relationships between people working together to carry out certain tasks is created (Skolik, Robak 2016, pp. 146-149).

The professional relationships established lead to the formation of social bonds between co-workers with an emotional basis. Relationships between team members are a key factor in the efficiency of their work. The friendly atmosphere of the

company affects the satisfaction and the feeling of fulfilment of the employee (Robak 2017, pp. 569–584).

Relations at work contribute to the achievement of specific objectives and participants in these relations interact with each other and realize individual needs and expectations, as well as common tasks and intentions.

Benefits from positive relations at work are not to be underestimated, since they can be depicted both in individual, and team and organisational context (Glińska-Noweś, et al. 2017, pp. 25-37).

With regard to the organisational profits generated from positive employee relations, their impact on the higher productivity related to effective communication, as well as stimulating employees' commitment and innovativeness should be underlined. Whereas, while analysing individual benefits from maintaining good interpersonal relations at work and friendly atmosphere, one should appreciate significance thereof not only in improving job satisfaction, but also in fulfilling the need of affiliation and acceptance, as well as the sense of security (Carmeli, Brueller, Dutton 2009, pp. 81-98; Robertson et al. 2020, pp.596-619).

In a crisis situation, which is working at the healthcare service during the COVID - 19 pandemic, care for good employee relations is a special challenge for the managerial staff, taking into consideration the intensity of stress and possibility of conflicts.

## **Methodology**

The research results constitute a part of a state-wide quantitative research concerning medical workers carried out in terms of the "Research on the opinion of medical workers concerning their functioning in the conditions of the COVID-19 pandemic in their place of work" program.

The research has been conducted together with a specialist external company, DRB Polonia in December 2020. In order to collect empirical data, the CATI phone survey technique has been used. The research included a randomly selected sample of 384 medical workers, determined on the base of information from GUS. The data showed that the research population of medical workers in 2018 was at 400 986 people. The research sample has been selected taking into consideration the representative character of the research population in reference to a division into professional groups.

The following problem has been posed in an assumed research concept: How do medical workers assess the actions of their employers in the field of managing the staff under the conditions of the COVID-19 pandemic.

Referring to the key aspects resulting from managing workers in a crisis situation, the research issues have been detailed into the following:

- providing a sense of safety at the workplace,
- maintaining employee relations.

The STATISTICA program has been used for the purposes of researching the significance of differences in reference to the assumed indicators concerning managing medical workers in a crisis situation related to the COVID-19 pandemic.

For assessing the significance of differences of analyzed variables, the following non-parametric tests have been used: Mann–Whitney U test (UMW), Kruskal–Wallis one-way ANOVA test (AKW).

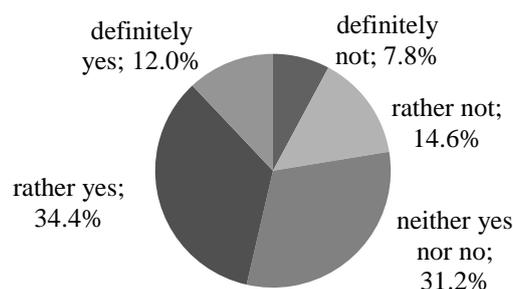
## Results and discussion

The research was conducted among 384 people who are professionally active medical workers, represented specific medical professions. The percentile share of specific professional groups in the research sample was at: doctors (22.4%), dental doctors (3.1%), pharmacists (7.3%), nurses (48.1%), midwives (5.7%), physical therapists (6.8%), laboratory diagnosticians (2.9%), and medical rescue workers (3.6%). There were 310 (80.73%) women and 74 (19.27%) men among all 384 interviewees. The interviewees were also diverse in terms of age, seniority in total, as well as work experience in the health service. Taking into account the type of employer's organizations – 269 (70.05%) were public units and 115 (29.95%) non-public facilities.

The respondents were asked to answer detailed research questions using a five-point scale. In order to make the analysis easier, the answers were grouped into three main categories, representing the respondent's assessment: negative - the sum of answer 1 and 2, neutral/undecided - answer 3 and positive - the sum of answer 4 and 5.

When asked whether their employer handles functioning in the conditions of a pandemic in reference to ensuring safety at the place of work, most – 68.8% of the respondents answered positively. Only 10.9% of respondents stated that their employee operates badly within this scope, and every fifth respondent did not provide a clear answer (20.03%).

The answers of respondents to the following question, concerning whether they feel safe at work during the time of the COVID-19 pandemic, are less optimistic because only 46.4% of the respondents provided positive feelings in this regard. Whereas, 22.4% of respondents stated that they do not feel safe at work, and almost every third person did not provide a clear answer (31.2%). Detailed data on this subject is presented in figure 1.

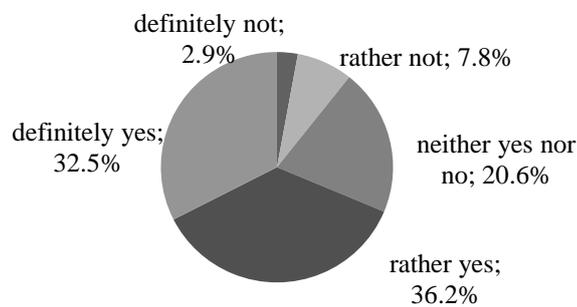


**Figure 1. Responses to the question: Do you feel safe in the workplace during the COVID-19 pandemic?**

Source: own research

As it results from collect data, the opinions of medical workers concerning a sense of safety were related to: the type of the employing organization (public, non-public), working in hospital or non-hospital units, employment in COVID-19 dedicated hospitals or non-covid hospitals, as well as living during the pandemic with people for whose health the respondents worry especially and gender as well.

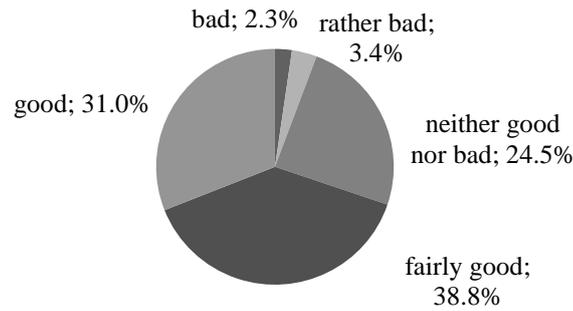
Results of research indicate that according to the opinion of the majority of respondents (68.8%) their employer handles it well to function during the COVID-19 pandemic in reference to maintaining proper employee relations. Only 10.7% of respondents had a different opinion, and 20.6% did not provide a clear answer. Detailed answers are presented in figure 2.



**Figure 2. Responses to the question: Does your employer cope with functioning in the conditions of the COVID-19 pandemic with regard to maintaining good employee relations?**

Source: own research

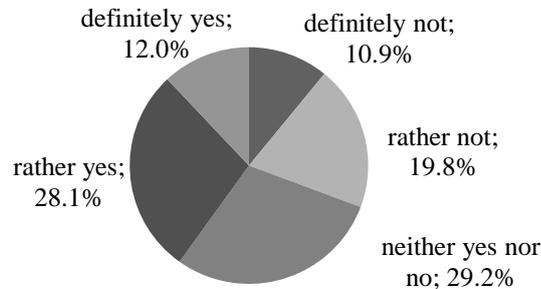
The assessments of medical workers concerning relations at the workplace in terms of relations with co-workers were equally positive. As many as 70% of respondents had positive opinions concerning relations with co-workers, 24.5% believed those relations to be neither good nor bad, and only 5.7% perceived this aspect of functioning at the workplace as negative (figure 3).



**Figure 3. Responses to the question: How do you assess relations in the workplace in terms of: relations with colleagues?**

Source: own research

In reference to these results, answers whether during the COVID-19 pandemic a larger number of conflict situations at the workplace has been observed, are also interesting. Most respondents (40.1%) confirmed an increase in conflicts among workers, 30.7% had a different opinion, and 29.2% did not provide a clear answer (figure 4).



**Figure 4. Responses to the question: During the COVID-19 pandemic, did you observe an increased number of conflict situations in the workplace?**

Source: own research

Statistical observation revealed also that the answers of respondents to this question have been differentiated due to:

- gender (UMW test  $p=0.0505$ ,  $\alpha = 0.05$ );
- the fact of living during the pandemic with people for whose health they especially worry (UMW test  $p=0.0405$ ,  $\alpha = 0.05$ );
- type of organization employing them - public and non-public (UMW test  $p=0.0200$ ,  $\alpha = 0.05$ ).

A statistical analysis shows that employees of public units confirmed an increase of misunderstandings among co-workers to a greater extent (43.1%) than respondents from non-public units (33%). Furthermore, women and respondents living with people for whose lives they were especially worried indicated conflicts between employees relatively more often.

The crisis situation related to the COVID-19 pandemic surely constitutes a new, difficult experience for medical workers, and it affects their opinions concerning the functioning at the workplace, as well as mental condition. The conducted observations correspond with the presented research results of other authors presented in source literature. An interesting reference consists in a work by De los Santos and Labrague (2021) indicating that nurses are characterized by an average or high fear of COVID-19, and the female gender is correlated with the fear of the virus. Moreover, as the fear of COVID-19 increases, so does the professional stress of nurses as well as their intentions of organizational rotation and will to leave work. Initiatives for medical workers at Italian hospitals, aimed at ensuring their safety, but also a sense of affiliation and emotional support, are undoubtedly an attempt to answer these challenges. The practices undertaken there served to strengthen the sense of being a part of a coherent team with common goals, and facilitated expressing thoughts and emotions through short informal talks in small groups or the support of a psychologist (Lissoni et al. 2020, pp. 105-107).

## Conclusion

Research results show relations between the sense of safety at work of medical personnel and relations among employees during the COVID-19 pandemic.

The presented research results emphasized the importance of the sense of safety at work during the COVID-19 pandemic and also indicated the important role of the managerial staff in shaping good relations among employees in this crisis situation.

Working out the proper methods of managing medical workers in a crisis situation conditioned by the COVID-19 pandemic, due to its unique, global, and long-lasting character - is surely not an easy task. However, this skilful help for the staff as well as initiatives in favour of forming proper employee relations may turn out to be the key factors that will translate into increased trust towards employers and identifying with the organization.

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# ACTUAL CORPORATE SOCIAL RESPONSIBILITY SPILLOVERS WITHIN ACTIVITIES OF FOODBANKS: FOCUS ON THE CZECH REPUBLIC

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## Abstract

**Purpose:** The sectoral point of view regarding food production and distribution determines food banks within intentions to reduce food waste by helping people in need. The growing trend in the use of food banks is mainly associated with changes in the living standards of the population, especially in connection with the current COVID-19 crisis.

**Design/methodology/approach:** In the current crisis, we can expect a growing need for help from food banks and the visibility of hidden problems in their operations. This article aims to identify the common factors for sustainable services provision of food banks and focuses on the situation in the Czech Republic

**Findings:** There are provided results of a questionnaire survey conducted among representatives and members of the Czech Federation of Food Banks, revealing identified common factors for sustainable services of food banks in the Czech Republic.

**Research limitations:** Although the current state of financial support for ensuring the activities of food banks by the state is assessed by food banks positively, the effort to change the scheme of financing food banks in the Czech Republic persists and it is even intensifying. The survey conducted among food banks also pointed out at the need to ensure non-financial support for the activities of food banks, including information support on the operations side.

**Social implications:** Partial results point out at the field of public awareness and a need for advisory support within operational activities of food banks in the Czech Republic. Food banks are intended to assist people in material need through charitable and humanitarian organizations acting as a cooperating organization within a respective region.

**Key words:** food banks, food waste, corporate social responsibility

## Introduction

Food banks are regarded from the sectoral point of view of food production and distribution as institutions helping to reduce food waste by helping people in need. Food banks in their current form provide their services in the Czech Republic free of charge, however, their activities are closely linked to subsidies from public budgets. At present, there is a tendency to modify the financial scheme of operation of domestic food banks that arises also from the need to recover public finances after COVID-19 crisis. On the other hand, COVID-19 crisis put unprecedented challenges to foodbanks within not only a growing demand for food help, but also regarding system of their operation activities.

This article aims at identification of common factors for sustainable services provision currently affecting activities of food banks and focuses on the situation in the Czech Republic. Despite the fact that first food banks emerged their activities in current form in the Czech Republic after year 2006, there is still a lack of research

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focusing on the efficiency side of their activities, specifically in Central and Eastern European countries. We are trying to partially fill this gap by the conducted primary survey that took part during autumn 2020 among representatives and members of the Czech Federation of Food Banks. This survey allowed to identify some common factors for sustainable services provision by food banks in the Czech Republic within corporate social responsibility aspects of their operations. We focus regarding the aforementioned survey in this article on areas of food bank operations as implementation of new features in their managerial information systems, structure of donors, management for preventing food waste, usage of voluntary work force, information support from government bodies/other participating entities or influence of COVID-19 crisis on operations of food banks in the Czech Republic.

## **Literature review / Research Background**

Despite a general positive perception on social corporate responsibility within activities of food banks worldwide, specifically in developed countries, its concept faced many challenges and developmental changes, such as the long-term dependence of food bank clients on the type of social services they provide or the growing share of consumption of unhealthy industrially produced food (e. g. Ballantyne et al., 2015; Wainwright et al., 2018).

Results of research conducted within economically developed countries provide findings on the US food bank network, where the improved cost management allows better food bank services. It addresses findings for tax cost management, mainly with the possibilities for improving communication and further cooperation of the involved food banks (Parker et al., 2020). Loopstra et al. (2019) provide findings on food banks operations out of the main food-banking network in England, regarding their dependency on unpaid voluntary work and sponsorship donations. In addition to the aforementioned findings, other study conducted in Great Britain pointed out the need to adjust the concept of food banks in order to improve the registration and information base not only with regard to local food production capacity, but also in the availability of information on living standards and related nutritional needs (Thompson et al., 2019). Similarly, Barker and Russell (2020) also argue recommendations for increasing the capacity of public authorities for the possibility of responding to deteriorating food security in Great Britain, improving the situation in the field of volunteering, or the possibility of taking into account the dietary restrictions of food bank clients.

Similarly, the need for adjusting the concept of foodbanks can be seen among newer member states of European Union, focusing on managerial approaches to mitigate food waste by a simultaneous synergy effects on people in need (e. g. Filimonau et al., 2019; Macková et al., 2019). Situation regarding operations of food banks in the Czech Republic is determined currently by active 15 regional food bank entities, including central distribution warehouse of the Czech Federation of Food Banks. Demand for help from foodbanks in the Czech Republic determines a year on year increase for about 60 %, i.e. distribution of foodstuff exceeding 7,000 tons in year 2020 (CFFB, 2021).

## Methodology

Methods of analysis and synthesis of both foreign and domestic information sources are employed. Partial outputs of the implemented primary research of efficiency aspects of the activities of food banks in the Czech Republic were also used for the elaboration of this contribution. The primary questionnaire survey was carried out during autumn 2020. The sample of respondents to the preliminary survey is based on 15 food banks at the regional level including the central food bank based with its warehouse in Prague. The primary research employed electronic questionnaires distributed via the Google Forms service. The questionnaire combined closed, semi-open and open questions. Totally 7 subjects participated in the primary research.

Results of the primary research were analysed beside a basic descriptive statistics also by a two-way factorial design in order to reveal variance components regarding the dependent variable to be the amount of foodstuff distributed by respective food bank in tons per the employee headcount in year 2019. These variance components were estimated by the analysis of variance (ANOVA), employing the Satterthwaite method procedure for synthesized errors inbuilt in the software Statistica 13. Statistically significant components of variance are then regarded as effects of surveyed aspect on activities of foodbanks according to their provided perceptions.

Abbreviations of researched factors:

- A – Sharing information on foodstuff inventory;
- B – Implementing new features of MIS - inventory management;
- C – A typical donor of foodstuff – retail store;
- D – A typical donor of foodstuff – small agri businesses;
- E – A typical donor of foodstuff – foodstuff manufacturers;
- F – A typical donor of foodstuff – large agri businesses;
- G – A typical donor of foodstuff – citizens.
- H – Management for preventing foodwaste – staff checkout during storage;
- I – Food disposal of foodstuff due to exceeding “best before” date;
- J – Actual need for voluntary work;
- K – Future need for voluntary work;
- L – COVID-19 crisis effect on operations;
- M – Satisfaction level – public subsidies for operations;
- N – Usage facilities/approaches above minimum requirements;
- O – Satisfaction level – government information and consultation support;
- P – Existence of “public private partnership”.

## Results and discussion

We consider an intensity indicator of food distributed per year by a food bank (data for year 2019) relativized to value per the employee headcount per year (including both paid and voluntary labour) as the ultimate measure of food banks’

operations effectiveness. The median value is 40 tons of food distributed per the employee headcount per year. Together with standard deviation at value 42.56, range of variation at nearly 80 %, it can be pointed out as a diverse situation in operations of foodbanks in the Czech Republic. The surveyed area covering new features in management of food banks' operations settled in the Czech Republic revealed mainly the fact that there is a lack of innovation activities' demand within their managerial information systems. Analysis of the questionnaire survey using ANOVA factorial design is showing the following finding in the aforementioned area (Table 1). The amount of food distributed per employee is not significantly distinguished neither by partial individual factors, nor by their interaction within aspects of sharing information and implementing new features of managerial information systems. This finding is consistent with identified mean level of satisfaction of surveyed regional food banks on their current managerial information systems regarding inventory management (median on Likert scale at value 5, standard deviation at 1.32). Consequently, a low perception of surveyed banks on a need for new features within inventory management (median on Likert scale at value 1, standard deviation at 1.36). On the other hand, the current best practise principles of the food banks' operations management inevitably leads to smarter approaches. Among representatives of these smart approaches can be mentioned dynamic shelf-life prediction or sequential resource allocation for more efficient services of food banks (e.g. Lien et al., 2014)

**Table 1. Analysis of variance components in the surveyed area “New features in management of food banks’ operations settled”**

Factor	Effect	df	MS	dfE	MSE	F	p
{1}A	Random	1	592.01	2.16	1994.03	0.30	0.64
{2}B	Random	3	113.81	2.00	5872.00	0.02	1.00
1*2	Random	0	0.00	-	-	-	-

Own processed output from software Statistica 13

Main aspect of corporate social responsibility of food banks activities is regarded a reduction of food waste via a simultaneous helping to people in need. Thus, abilities of food banks in coordination among their respective stakeholders were researched using respective partial factor design in the conducted questionnaire survey (Table 2). There were identified two main factors as a common effect regarding the area of donors to food banks on the observed dependent variable, i. e. the amount of food distributed by food banks per year per the employee headcount. These are typical donors to foodbanks to be small agriculture businesses (significance level at 10 %) and a typical donors to be citizens (significance level at 5%), which are identified as significant variance components to the observed dependent variable. In other words, small agriculture businesses and citizens are not regular donors to foodbanks in the Czech Republic, mainly because of the coordination constraints. Therefore, the food collection campaigns are rather a seasonal one in comparison with regular supplies from retail stores chains and wholesales.

**Table 2. Analysis of variance components in the surveyed area “Typical donors to food banks”**

Factor	Effect	df	MS	dfE	MSE	F	p
{1} C	Random	3	1124.89	2.11	1894.35	0.59	0.67
{2} D	Random	2	4609.13	1.00	84.50	54.55	0.10
1*2	Random	0	0.00	-	-	-	-
{1} E	Random	2	526.38	3.05	2123.21	0.25	0.79
{2} F	Random	1	1536.00	3.00	3362.89	0.46	0.55
1*2	Random	0	0.00	-	-	-	-
{1} D	Random	2	3255.09	0.99	5662.85	0.57	0.68
{2} G	Random	1	5304.50	3.00	287.58	18.45	0.02
1*2	Random	0	0.00	-	-	-	-

Own processed output from software Statistica 13

An insight into the perception of foodbanks on food waste reduction within their own operations are provided using a partial factor design of researched elements, regarding food banks' management for preventing food waste and related incidence of food disposal (Table 3). The mutual interaction of both aforementioned factors are statistically significant variance components to the observed dependent variable of food distributed per year per the employee headcount. This finding implies on the need of staff workers to a continuous checking process of best before and time of consumption dates regarding the shelf-life of the foodstuff. Together with a lack of processes' automatization among food banks in the Czech Republic (response of foodbanks regarding a managerial information system features regarding shelf-life management reveals median value on the Likert scale to be 1 and standard deviation to be 1.36) it could be partially concluded as a source of partial inefficiency of food banks' operations in the Czech Republic.

**Table 3. Analysis of variance components in the surveyed area “Food banks' management for preventing food waste”**

Factor	Effect	df	MS	dfE	MSE	F	p
{1}H	Random	1	6508.93	1.01	4632.62	1.41	0.44
{2}I	Random	2	295.96	1.00	5631.60	0.05	0.95
1*2	Random	1	5250.08	2.00	163.25	32.16	0.03

Own processed output from software Statistica 13

Previous results arising from the analysis of variance using a factorial design in Table 3 can be further analysed via an existence of effect on observed variance within amount of food distributed by food banks, employing factor of voluntary work demandingness of food banks in the Czech Republic (Table 4). Both actual and future need for voluntary work were not identified as a distinguishing factor for foodstuff distribution by domestic food banks. Along with the identified persisting preference of domestic food banks in actual and future usage of voluntary work force (actual usage with the mean preference on the Likert scale at value 3 with standard deviation value 0.53, for future usage, respectively, is

the mean of preference on the Likert scale at value 4 with standard deviation value 1.40).

**Table 4. Analysis of variance components in the surveyed area “Perception on voluntary work”**

Factor	Effect	df	MS	dfE	MSE	F	p
{1}J	Random	2	643.31	3.99	2590.64	0.25	0.79
{2}I	Random	1	1498.13	3.00	3297.56	0.45	0.55
1*2	Random	0	0.00	-	-	-	-
{1}K	Random	1	836.01	0.54	119.79	6.98	0.37
{1}I	Random	2	210.46	3.00	3806.83	0.06	0.95
1*2	Random	0	0.00	-	-	-	-

Own processed output from software Statistica 13

An insight into the perception of foodbanks on influence of COVID-19 crisis within their operations is provided via a suitable factor design (Table 5). It can be concluded that despite a reported influence of COVID-19 crisis on operations of domestic food banks in this observed area (mean value of impact perception on the Likert scale at value 4 with standard deviation value 0.70), the COVID-19 crisis in 2020 cannot be regarded as a negative effect on their ability to distribute food to their clients. However, this finding has to be discussed in mutual interaction of assessed factor named satisfaction level with financial support to foodbanks by public budget (mean value 4 at the Likert type scale with standard deviation at value 0.93), proving a high level of foodbanks' satisfaction with current subsidies from public budget for their operations.

**Table 5. Analysis of variance components in the surveyed area “COVID-19 crisis effect”**

Factor	Effect	df	MS	dfE	MSE	F	p
{1}L	Random	2	1533.05	2.20	2402.83	0.64	0.60
{2}M	Random	2	4574.42	2.00	231.25	19.78	0.05
1*2	Random	0	0.00	-	-	-	-

Own processed output from software Statistica 13

Our findings regarding a perception of domestic food banks on their stable financial position have to be discussed within a persistent need to change the system of financing of food banks' operation in the Czech Republic. Ministry of Agriculture of the Czech Republic (2019) states a need for finding an alternative way for providing finance to sustain food banks' services in the Czech Republic, in order to anchor their role in a social responsibility concept of helping people in need by a simultaneous addition to food waste reduction.

An insight into the perception of foodbanks on a need for the information support of government authorities is provided via a respective factor design (Table 6).

**Table 6. Analysis of variance components in the surveyed area “Need for the information support of government authorities”**

Factor	Effect	df	MS	dfE	MSE	F	p
{1}O	Random	2	1033.05	1.24	5480.44	0.19	0.85
{2}N	Random	1	4332.00	1.00	5461.33	0.79	0.54
1*2	Random	1	5461.33	2.00	409.00	13.35	0.07
{1}O	Random	2	1033.05	2.53	2683.98	0.38	0.71
{1}P	Random	2	4359.38	1.00	1797.21	2.43	0.41
1*2	Random	1	1874.57	1.00	18.00	104.14	0.06

Own processed output from software Statistica 13

The employed factors, which were surveyed in the information support area to foodbanks revealed a following findings. Firstly, a statistically significant interaction both of the factor that reveals the satisfactory level with information support to food banks provided by government authorities together with the usage of facilities and approaches above the minimum requirements for food handling. Secondly, a positive influence of public private partnership cooperation between food banks and private business entities. Interaction within the both aforementioned factors' groups is statistically significant at a 10 % significance level. So, despite a reported lower satisfactory level of foodbanks on information support of foodbanks, there are prevalingly employed facilities and approaches above minimum required standards among domestic food banks, which are relevant components of observed variance in the amount of food distributed. This finding is consistent with results of other foreign studies on food banks' operating activities, which stress a need for rigorous information support to be a common factor of their efficient service provision (e.g. Barker and Russell, 2020; Parnham et al., 2020). Subsequently, the identified lower level of satisfaction within cooperation of food banks on the basis of public private partnership together with satisfaction level regarding the factor government information and consultation services of government authorities also allow to significantly distinguish the variance within amount of food distributed by food banks.

## Conclusion

Food banks provide an inevitable assistance to people in material need through charitable and humanitarian organizations, acting as stakeholders of the respective regional food bank in the Czech Republic. The support of their activities by the government authorities is currently perceived as indispensable for food banks' sustainable operations. These are not only subsidies for the operations of food banks itself, but also for investments related to the possibility to sustain and expand their services. Although the current state of financial support for the provision of food bank activities is perceived positively by domestic food banks, there is an existing effort to change the scheme of financing food banks in the Czech Republic. Consequently, despite a nowadays perceived stable financial situation thanks to subsidies from public budgets, domestic food

banks rely on voluntary workforce, and this voluntary work is also regarded as inevitable for future services by food banks in the Czech Republic. New challenges for food banks brought the COVID-19 crisis. The primary questionnaire survey carried out among food banks pointed to the need to ensure non-financial support for the activities of food banks in the field of public awareness and advisory support for operational activities. This fact is consistent with a need to catch up on best practise in the provision of food banks' services that is inevitably bound with introduction of innovations to their activities and related services. Presented article is a partial output of an ongoing research focused on the identification of current trends and best practices of sustainable operations of food banks. Future research on activities and current trends in food banks' services is going to be focused more on stakeholders of food banks, specifically within Central and Eastern European Countries, where empirical studies are not so common, in order to identify intentions and other important aspects to be reflected towards a sustainable development and service of food banks networks.

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## ANALYSIS OF GREEN GROWTH IN FOREST CONDITIONS

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**Abstract:** The aim of the work is the analysis of green growth in the conditions of forestry. Based on the analysis of green growth indicators, we compiled a questionnaire focused on the current situation of LH. The purpose of green growth is to use indicators to implement a strategy in forest companies that, on the one hand, will bring economic growth and, on the other hand, reduce the impact of increasing performance on the environment. Green growth in the conditions of the Slovak Republic deals with increasing economic growth and at the same time tries to minimize the influencing effects of environmental problems such as air quality, the level of recycling, and environmental protection on natural capital. Based on the analysis of secondary sources aimed at approaching the issue of green growth and its indicators, a questionnaire survey was prepared. The questionnaire consisted of open-ended and closed-ended questions and was divided into four main areas of study of green growth. Based on a questionnaire survey, the situation in forestry in the conditions of the Slovak Republic was mapped. The results show that the introduction of a green growth strategy into forestry is important in terms of long-term economic growth and minimizing environmental impacts.

**Key words:** green growth, indicators of green growth, forestry

### Introduction

Green growth today requires a new perspective on society and the environment. The strategy of green growth is our common future, to which we should move forward and strive to create economic growth and at the same time, to use natural resources as little as possible. Given the worsening climate change that is happening in the world, it is necessary to start thinking about future generations. Green growth promotes long-term economic benefits for the environment. The concept of green growth is nowadays a much-discussed topic that is being addressed by many countries. Green growth in the conditions of the Slovak Republic deals with increasing economic growth and at the same time tries to minimize the negative effects on natural capital. Green growth is considered a practical tool for achieving sustainable development. Currently, the Slovak Republic faces many environmental problems such as air quality, the level of recycling, and the protection of ecosystems. Environmental problems affect not only the economy and employment but also the well-being of people. The purpose of green growth is to use indicators to implement a strategy in forest companies that would increase economic growth on the one hand and reduce the impact on the environment on the other. The aim of the presented article is to map the situation in forest companies on the basis of green growth indicators.

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## **Green growth**

By 2050, the world's population is expected to include 9 billion people, all of whom will still have food, water, and water. The most effective way forward is inclusive green growth, which is environmentally positive, efficient in the use of natural resources, and satisfies the needs of all people (The World Bank 2012). Green growth was the main topic at the Rio +20 conferences on sustainable development in 2012 and will appear in the outcome document „The World We Want ”, which requires a green economy and sustainable development (UN 2012). The concept of green growth has since become a response to a warning about climate change and ecological degradation (Dale et al. 2016). The overall economic expansion, which is measured by GDP, says that green growth can be linked to the ecology of our planet. The idea of green growth was hidden behind sustainable development from the Brundtland Commission until the first conference in Rio, but earlier texts were formulated as ecological modernization or the Environmental Kuznets curve (Ayres et al. 1993, Weizsäcker et al. 1998). The formulation and implementation of a green growth strategy are due to the impact of social and economic flows on ecosystems, which can pose a risk to economic growth and development processes. Natural capital is often underestimated and therefore difficult to manage (OECD 2011b). The goal of green growth is to strengthen investment and innovation, which form the basis of sustainable development and at the same time open up new economic opportunities (Przychodzen et al. 2020, p. 27). To support green growth, it is important to examine the conditions under which it is shaped and its impact on sustainable development. Green and sustainable development is widely recognized as a certain understanding of modern society. This concept represents a state of society where living conditions and the use of natural resources still satisfy human needs without compromising the integrity, stability, and balance of the natural system (Pham et al. 2020, p. 2).

## **Methodology**

In order to meet the set goal, it was necessary to perform an analysis of secondary sources focused on green growth and its implementation in forestry companies. Secondary sources describe basic concepts such as green growth and its indicators. Based on the analysis of secondary sources, a questionnaire survey was compiled to map the situation in forestry in the conditions of the Slovak Republic. Methods such as summarization, synthesis of knowledge, and analogy were used in individual steps. Finally, the achieved results were evaluated.

The questionnaire survey was compiled on the basis of green growth indicators in the conditions of the Slovak Republic. The questions focused on 4 main indicators, which are described in more detail below. The basic set of research was forest companies, to which the questionnaire was sent online due to the current pandemic situation.

The OECD Green Growth Indicators are organized according to four main objectives, which relate to a low-carbon economy, the preservation of natural resources, improving the quality of life, implementing policy measures, and seizing economic opportunities. Countries are working to implement green growth policies by promoting new technologies and innovation and using economic instruments. Areas that produce environmental goods and services are maintaining a growing trend in the economy. International financial flows are also being created that support green growth. The main indicators of green growth are (OECD360, Slovak Republic, How is Slovakia doing? 2015):

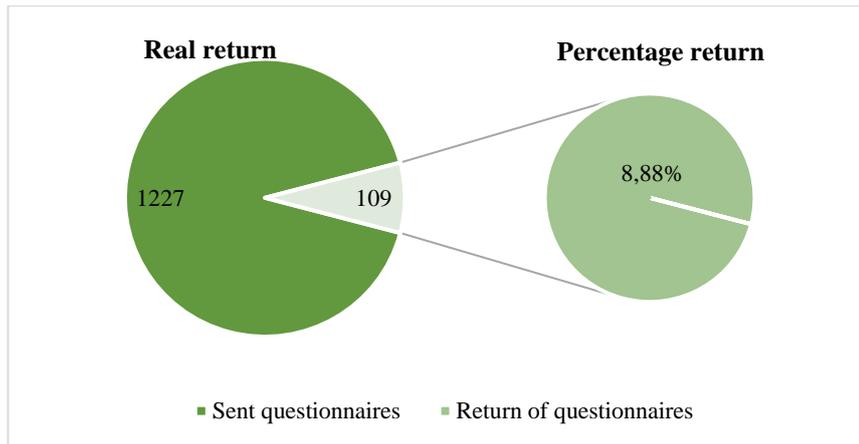
- Environmental and resource productivity
- Natural asset base
- Environmental quality of life
- Economic instruments and policy measures

Environmental and resource productivity includes the need for efficient use of natural resources or the lowest possible volume of consumed natural resources to create the highest possible economic output. Indicators include CO<sub>2</sub> productivity, energy productivity, and source productivity. Natural asset base says that if the base of natural wealth is reduced, it will point to risk to growth and at the same time it will point to the fact that sustainable growth requires that natural resources be used in the most considerate way possible. Indicators of environmental quality of life monitor the direct effects of the state of the environment on human well-being and also the consequences of dangerous effects of pollution on human health.

The introduction of green economy indicators into forestry ensures further investments, the use of renewable resources, the creation of new jobs, the introduction of more environmentally friendly technologies. Another benefit of these indicators is the creation of green jobs, which allow decisions to be based on the evaluation of forest ecosystem services and the provision of social justice (Majdánková et al. 2021, p. 10).

## Results

The questionnaire method (graphically shown in Graph 1) addressed 1,227 forest companies, of which 109 were answered questionnaires, which represents an 8.88% return. The results of the questionnaire survey were evaluated as a percentage and the intention was to find out the current situation in forest companies within the implementation of the green growth strategy.



**Graph 1 Return on questionnaire survey**

Source: own research

Each of the main indicators of green growth examines a specific area that provides information about a specific indicator. In the analysis of energy savings, we monitored which energy reduction is mostly used by forest companies. The main goal of efficient use of energy is to reduce losses in its use, without lowering the standard of living, as well as reducing the demands on the protection of the natural environment. With the indicator of natural wealth, we analyzed natural resources and their mapping in the conditions of the Slovak Republic. By analyzing the environmental quality of life, we monitored the application of the principles of sustainable development and whether entrepreneurs create internal standards of employee care. As an indicator of economic instruments and policy measures, we have tried to point out that it is necessary to introduce new technologies even more into the production and to implement innovations within the framework of the most environmentally friendly use of natural resources. Table 1 clearly shows the analyzed areas of green growth.

**Table 1 Analyzed areas of green growth**

<b>INDICATOR</b>	<b>ANALYSIS</b>
Environmental and resources productivity	Energy saving
Natural asset base	Growing stock, wood composition, age structure, protected areas, protected species of plants and animals, harmful factors
Environmental quality of life	Application of the principles of sustainable development, internal standards of employee care, contribution to the construction of recreational function of the forest
Economic opportunities	Integration of new technologies, certification standards, environmental labeling of products, environmental management system, environmental management and audit scheme, ISO standards for environment

Source: own research

Table 2 shows the results of the questionnaire survey according to the evaluated areas. According to individual indicators, which have already been characterized, the situation in forestry is mapped.

For the Environmental and Resource Productivity indicator, we analyzed energy savings, where most respondents reported a reduction in energy losses, which accounted for 42%. The indicator contains the need for efficient use of natural resources. This means that from the smallest possible volume of consumed natural resources to create the highest possible economic output.

The Natural Asset base indicator analyzes the natural wealth that needs to be used in the most environmentally friendly way possible. This indicator analyzes the standing stock, tree composition, age structure, protected areas, protected plant and animal species, and harmful factors. The analysis shows that deciduous forests predominate in the conditions of the Slovak Republic and the main representation is forest beech. The majority of respondents (61%) state that their company is located in a protected area, which subsequently showed that there are protected species of plants or animals in their territory. Respondents mentioned wind and woodpeckers and wood-destroying insects as the biggest harmful factors, most of which are spruce coats.

For the Environmental Quality of Life indicator, the question was focused on the principles of sustainable development, where up to 88% of respondents apply these principles. It is considered negative that employers do not have internal standards focused on employee care. More than 68% of respondents contribute their profits to the recreational function of the forest.

The area of Economic Instruments and Policy Measures was focused on finding out the state of the introduction of new technologies, certification standards, environmental labeling of products, use of EMS, and ISO environmental standards.

In the analysis of this indicator, it was found that most of the respondents do not use forest certification, environmental labeling of products, EMS, or ISO environmental standards.

**Table 2 Results of the questionnaire survey**

<b>Analysis areas</b>	<b>Percentage</b>
Reduction of energy losses	42%
Growing stock of coniferous forest	0-150 m
Growing stock of deciduous forests	151- 500 m
Wood composition	English Oak and norway spruce
Age structure	10 or more
Protected areas	61% yes
Protected species of plants	67% yes
Protected species of animals	79% yes
Harmful factors	Wind, bark beetles and wood-destroying insects
Application of the principles of SD	88% yes
Internal standards of employee care	67% no
Contribution to the construction of recreational function of the forest	0 - 5%
Integration of new technologies	59% yes
Certification standards	67% no
Environmental labeling of products	83% no
Environmental management system	96% no
Environmental management and audit scheme	99% no
ISO standards for environment	92% no

Source: own research

## Discussion

Multifactor productivity and resource efficiency depend on the technical refurbishment of forestry and the logging industry, the production of high value-added products, the use of logging waste, and other rational uses of non-timber forest resources (Knyazeva et al. 2016, p.27). According to national socio-economic conditions, the introduction of green principles contributes to increasing the role of the forestry sector in increasing the well-being of the population, receiving income from the production of timber and timber products, and providing ecosystem services. The forestry sector, which fulfills socio-ecological-economic functions, expands intersectoral cooperation with organizations and structures of the environmental and social sphere, agriculture, and local people (Yakovleva et al. 2019, p. 9). In the concept of a green economy, the forest acts not only as a raw material component of the production process but also as a part of the ecological and social infrastructure of territorial development. This makes it possible to provide a long-term and multifaceted solution to the state of forest resources, the rational use and improvement of the environment, with the involvement of a wide range of stakeholders. When developing a project to implement green principles in forestry, it is necessary to raise the awareness of residents and local people about the processes of improving the national forest policy and system of relations in forests (Yakovleva et al. 2019, p. 9). According to Hallegatte (2011), the goal of green growth strategies is to reduce development risk and thus increase the resilience of the economic system. The loss of natural capital can be compensated by other types of capital in the short term, but not in the long term. An example could be the increase in the use of fertilizers to compensate for soil degradation – a short – term solution that is not sustainable in the long term. The introduction of green economy principles in the forest sector enables to provide the inflow of additional investments, sustainable production, and consumption of forest products, and consumption of forest products, the introduction of environmentally friendly and resource-efficient production technologies, and consumption patterns of forest products, including waste recycling and wood consumption (Yakovleva et al. 2019, p. 9). The meaning and consequences of Green Growth and De growth for the firm are still heavily understudied, with studies looking at firm or supply chain sustainability focusing on the Circular Economy instead (Belmonte-Ureña et al. 2021). Authors Vazquez-Brust and Plaza Úbeda (2020) use a survey of 500 Argentinean firms and multiple discriminant analysis to study the characteristics of firms that have environmental performance going beyond the requirements of regulation in environmental protection. However, only managers with green growth beliefs allowed discrimination beyond firms not complying with regulations and those which were complying. In alignment with the conclusions by Khairunnessa et al. (2021) and Piao et al. (2021), the results of this paper show that in countries with weak regulatory institutions, the “Green Growth State” can only protect the environment if there is strong ecological citizenship with managers endorsing the pro-environmental paradigms of development proposed by green growth.

## Conclusion

The present contribution deals with indicators of green growth and their application in forestry. The aim of the paper is to approach the issue of green growth and analyze its indicators in forestry. Based on the analysis of secondary sources aimed at approaching the issue of green growth and its indicators, a questionnaire survey was prepared. The questionnaire consisted of open-ended and closed-ended questions and was divided into four main areas of study of green growth. Based on a questionnaire survey, the situation in forestry companies in the Slovak Republic was mapped. Negative results include the fact that most respondents do not use certification standards, product eco-labeling, EMS, or ISO environmental standards. We consider the positive results to be the fact that most respondents use the implementation of the principles of TUR and try to implement new technologies into production. The results show that the introduction of a green growth strategy into forestry is important in terms of long-term economic growth and minimizing environmental impacts.

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# APPLICATION OF THE THEORY OF FRAMES IN ORGANISATIONAL CONFLICT RESOLUTION

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**Abstract:** This article deals with the use of Frame Analysis in research and organisational conflict. The first part of the study includes the theoretical foundations of the frame analysis in its classic form presented by Erving Goffman. The following sections include a discussion of the concepts in the area of management sciences that allow the incorporation of frame theory into organisational studies. The empirical section includes an analysis of the cases of parties' behaviour during mediation in collective disputes, which were interpreted in light of the frame theory.

**Purpose:** The aim of the paper is examine how the Frame Analysis can be useful for the organizational conflict resolution.

**Methodology:** The analysis is based on the assumptions of the methodology of qualitative research in sociology. The article ends with theoretical and practical conclusions regarding the explanation of the course of an organizational conflict and the role of the mediator in resolving it.

**Findings:** Not only Interest Based Approach is applicable to the organizational conflict resolution procedure but also Humanistic Approach is very effective in this scope.

**Keywords:** Anthropology of Experience, Frame Analysis, Humanistic Approach to Management, Mediation in a Collective Dispute, Organizational Conflict.

## Introduction

The term "frame" is often used in social sciences, especially in qualitative sociology. Its creator is widely recognized as Erving Goffman, who devoted an extensive 600-page book to this issue (Goffman 1986) entitled *Frame Analysis* (the Polish version was released in 2010). The "Essay on the Organisation of Experience" subtitle deserves special attention. It is this key term, namely "organisation of experience," that will be used later to explain the function of the frame analysis.

What is the meaning of "frame" in social life? This is Goffman's understanding of the frame presented by Krzysztof Konecki: "Although the frame is not clearly defined by Goffman, its metaphorical references allow us to understand the pattern by which we define situations. The frame is the "border" of a certain band of experiencing events. Frames make it possible to understand experiences, and there are many, although a few are essential. Just as the frames of paintings make it possible to focus on what is inside the painting, the frames of experience enable to understand and organize them." (Konecki 2012: p. 177) The metaphor of the frame is interesting because it draws attention to a fact from the history of art: the appearance of easel painting during the early Renaissance, the so-called *quattrocenta*. Previously, painting had a rather decorative function. Various objects

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were decorated with paintings, including altars and walls of buildings, but the painting as an autonomous work did not actually exist. The picture frame not only makes the composition and the painter's point of view extremely important. The painting was a window to the reality it presented. When approached this way, the frame is a good metaphor to define a point of reference, a context in which a fragment of reality is perceived - including social reality.

### Literature review

But what is a frame when looking from a sociological perspective? Marek Czyżewski, in the introduction to *Frame Analysis*, explains this concept as follows: "Key terms of the book -<frame> (frame, interpretation scheme, answer to the question <what is going on here?>) and "framing" (applying a <frame> - interpretation scheme) (...)" (Czyżewski 2010, p. 7) The key concept in the above approach to the issue of "frame" is the "scheme of interpretation:" that is, the question "what is going on here?" This question means that the reception and diagnosis of the social situation is not obvious. One should approach the perceived situation in a specific interpretive frame, but what does that really mean? At this point, it is necessary to take a closer look at Goffman's frame and the intellectual tradition from which the theory is derived. Simply put, the frame is a scheme for interpreting experience, meaning how a person understands the interaction in which he/she participates and his/her role in it. It is no coincidence that Marek Czyżewski, explaining the concept of Goffman's frame, refers to the colloquial phrase "what is going on here?" often used by people who resolve conflicts or try to control disorganisation or chaos in social groups. Whoever finds the answer to this question and takes control of the situation will gain power over social actors. From that point on, everyone participating in the interaction will perceive and understand it according to the scheme (frame) imposed by that person.

When introducing the issue of the frame in Goffman's approach, the following typology can be indicated: "Goffman distinguished primary frames, which are fundamental to our experiencing of the world. There is nothing before them, and they are not preceded by cultural constructs. In this context, people distinguish between the natural and social frames. Natural frames are anchored to physical objects such as the body, the environment, and natural events such as natural disasters. On the other hand, the social frame is anchored in the social environment and is a derivative of planned human activities. Frames have rules of what is inside the frame and what is excluded from it." (Konecki 2012, p. 177) The natural frame may be, for example, gender and the roles it determines. As far as the social frames are concerned, an example may be the phenomenon of a generation as a community of experiences, e.g. the Generation of Columbuses, a term introduced by the writer Roman Bratny to denote a generation of young people during the occupation and World War II. Thus, their perception of the world (the frame) were affected mainly by the experiences of war. A characteristic feature of the frame is the contour, the border that separates what is inside from what is outside the frame. In other words, certain things should, or even must, be within the frame, while they are unable to. If a frame

of joke or irony is adopted for an interaction, then it is not right to be offended by such behaviour which, if taken "seriously," should inevitably trigger such a reaction.<sup>1</sup> They break the "let me save face" principle. For example, it is not proper for famous people to be offended by the jokes directed at them in satirical programs. Being offended in such situations is considered to have a lack of sense of humour and even lack of class.

An important issue in Goffman's theory is frame transformations. These include transpositions and fabrications. It is impossible to describe all types of transformations (Goffman has devoted a lot of space to them). Therefore, only an example of a sports competition will be presented. It is known that many sports disciplines, e.g. in track and field or in martial arts, come from war. However, in sports, no one wants to kill anyone. Almost the same activities as in war are performed, but in a different frame. You have to bow to your opponent or shake hands. You also have to follow a code that does not apply in a "real fight," e.g. you must not hit below the belt. Another transposition could be training of a sales representative, where they have to deal with difficult customers in a pre-defined staged situation, and where the customers are played by other sales representatives.

Fabrications that serve to create the impression that the observed event has a different meaning than it really had are another matter. The idea is to create an "ad hoc" new frame to confuse the recipient's perception. "The point here is to fabricate the impression that what is happening has a different meaning than what is actually attributed to it by the authors of the fabrication. These are usually manipulations and <creating impressions> to mislead the recipient of the messages" (Konecki 2012, p. 178). The case is similar when the "joke frame" is changed to the "serious frame," which is usually accompanied by the following statement: "Let's talk seriously now." However, this is not strictly a fabrication of the frame. Such an activity is best described by the term "reframing." For this purpose, "out-of-frame activities" which serve to "break the frame" can be used. Using the right joke, you can ridicule or embarrass someone, or even completely change the meaning of their behaviour or speech. This is why, in an organisation like the military, officers, non-commissioned officers, and other soldiers have separate casinos. The point is that subordinates do not have the opportunity to see their superiors in "out of frame situations" or performing "out of frame activities" that could jeopardise their authority. In this respect, Goffman's frame resembles the "scene" he described earlier, and the preparation of the frame can be compared to "behind-the-scenes activities" (Goffman 1977).

As Krzysztof Konecki states, one of the most important concepts of frame analysis is "applying a frame" (Konecki 2012, p. 179). This has already been partially mentioned in the previous part of the discussion, when specifying primary and secondary frames. This process can also be encountered during disputes or even

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<sup>1</sup>Interesting study of the role of laughter as a part of framing in social interaction gives Phillip Glenn (2003) in his book: *Laughter in Interaction*, Cambridge University Press, Cambridge.

negotiations, when the choice of language or specific concepts becomes the "application of a frame." Whoever applies their frame constructs the course of interaction on his/her own terms, and the other participants of the interaction take part in "his/her spectacle."

## Experience

The subtitle of Goffman's book entitled *Frame Analysis* is "An Essay on the Organisation of Experience." Since the frame, as defined by Goffman, is to be an instrument that allows us "to control experience," it is necessary to answer the question: "what is human experience?" This is how Antoni Stępień defines experience: it is "a conscious act of obtaining information about an object through its direct and eye approach, as well as the cognitive result of this activity, formulated in the form of a judgment or empirical sentence; colloquially - experiencing something or being tested and their consequences (in the form of, for example, knowledge and efficiency), as well as participating in something" (Stępień 1997, p. 119). In the above sense, the term "participating" draws attention. In this context, experience appears as gaining knowledge through participation, as opposed to gaining knowledge in a purely verbal manner, e.g. reading, listening, etc. Edward M. Bruner, in the introduction to his and Viktor Turner's collective work, refers to the concept of experience by Wilhelm Dilthey: "Dilthey understands experience as an eruption from routine and as an attempt to express it. It is a disturbance that disrupts the daily routine, an isolated sequence of events with a beginning, middle, and ending. This is the way in which people talk about what is most significant in their lives" (Bruner 1986, p. 13). Human experience appears in this context as a journey of some kind, as a result of which a person becomes someone different than before it began.

In this context, experience can be understood as a rite of passage. This is an essentially transgressive process. It is also a process of change taking place in three stages: (1) the phase of freezing the existing knowledge, (2) the phase of unfreezing this knowledge, which can be called the liminal (transitional) phase, during which the previous knowledge turns out to be useless, (3) the phase of freezing new knowledge and identity. The liminal phase is therefore similar to purgatory, in which there is a purification of old, unnecessary knowledge and identity in order to make a place for the new (Bylok, Cichobłaziński 2015, p. 55; Czarniawska 2010, p. 156). Victor Turner calls it a *rites de passage* (Turner 1975, p. 231).<sup>2</sup> Such an approach in management sciences is used by Barbara Czarniawska in her analyses of organisational change: "In our study of the work of advisors, Carmelo Maza and I suggested that reorganisation or reform could be viewed as bringing a group of workers into a liminal state, as anthropologists called the space (and time) between one state and another (the classic example of a liminal space is purgatory)" (Czarniawska 2010, p. 156). Thus, it can be concluded that every change, including organisational change, from the perspective of the constructivist approach, is a kind

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<sup>2</sup>Arnold van Gennep is the originator of the term "rites of passage" (van Gennep, 2006).

of a ritual of passage. If you look at the lives of organisations and people, it is a series of rituals of passage. Some of them are awaited and prepared, while others are surprising and are a source of great discomfort or even trauma, and individuals and groups try to avoid them with all their strength. However, this is not always possible.

### **Frame analysis in management**

The above presentation of frame analysis shows its sociological and anthropological character. The question arises: how can this analysis be used in research in the area of management, especially organisational conflict management and resolution, including negotiations? In Polish literature, the most important author who referred to this methodological tradition, which can be broadly called constructivist research regarding organisation, is Barbara Czarniawska. Taking the above into account, a book devoted to changes in the management of a big city is particularly interesting (Czarniawska 2014). In the cited analysis, the author used a slightly different term for frame (in Polish), but it can be understood similarly to Goffman's frame. There are also attempts to use this method in research on organisational conflicts (Cichobłaziński 2011, 2013, 2016). Conflict resolution is based not only on seeking consensus in the area of interests. The search for a common point of view by the conflicting parties, which focuses on issues related to the perception of conflict interaction, seems to be significantly more difficult and primary in relation to interests. With this approach to the problem, the issues of frame, framing, and reframing seem to be fundamental.

According to Barbara Czarniawska, "changing the frame" or "reframing (...)" means a quick and flexible change in the perception of the world as the situation develops. The need to change the perception was particularly evident in relation to the metro, where employees faced the need to move from construction to operation, and Warsaw residents from the "metro under construction" to the "metro as a means of transport" (Czarniawska 2014, p. 29). Is the "change of frame" fast and flexible, is it a completely different problem? Sometimes it is. However, the first question that must be asked is: do people want to change or do they like to be flexible? The classic theory of Leon Festinger's cognitive dissonance indicates that there may be serious problems with the above (Festinger 2007). It seems that the point of view, specifically due to external influence, is the hardest to be changed. And this is precisely what happens in negotiations, when both sides quite openly influence each other. When both participants of an interaction are under pressure, it is difficult to be ready to adopt a different perspective, but on the other hand, it is difficult to reach an agreement without such a change. Apart from "reframing," Czarniawska uses one more term that can be found in many publications regarding negotiation, i.e. "anchoring." It should be emphasised that, in economics, in the theory of making, and also in negotiations, "anchoring" is treated as a cognitive error (Brzezicka 2016). In the broadest sense of the negotiations, however, such an approach seems to be untenable. Every position, every point of view, profit and loss assessment has its anchor. This does not mean that what Goffman called "frame fabrication" cannot take place, which, in the case of the anchoring effect, can be called "over-anchoring."

### **Frames and anchors in negotiations**

The term used in negotiation theory that comes closest to Goffman's frame analysis is BATNA. It is an acronym of "Best Alternative to a Negotiated Agreement" (Fisher and Ury 1991, pp. 50-54). This is how the authors define BATNA: "The reason you negotiate is to get something better than what you could achieve without negotiating. What could it be? What's the alternative? What's your BATNA - your best alternative to a negotiated deal? This is a measure to evaluate any proposed agreement. This is the only measure that can protect you, on the one hand, against accepting conditions that are too unfavourable, and on the other hand, against rejecting conditions that may be in your interest" (Fisher and Ury 1991, p. 51). Therefore, BATNA performs the same function as the frame performs in Goffman's approach. It makes it possible to evaluate what is beneficial and what is not. In negotiation, you can have a strong BATNA when the negotiating participant has other opportunities to obtain the negotiated value, and a weak BATNA when there is no way out. You can also carry out frame/BATNA transformations, an example of which is a bluff, where a weak BATNA is presented as stronger than it is in reality. Similar principles can be used to apply the "anchor point" in negotiations (Malhotra and Bazerman 2008). The most common use of an "anchor point" is when quoting a price. The price listed first becomes an "anchoring point" for evaluating any subsequent compromises or escalations. The "fabrication" most frequently used by sales representatives is organising promotions or providing the original price and the sale price on one tag. The difference between these prices is to inform the buyer about savings, while this is a regular Goffman fabrication, as no discount took place. Interesting application of frame analysis one can be find in the paper written by Phillip Glenn (2010). The author cites the excerpt of real mediation: "Chuck picks up on the substantive framing of "rent" to state an amount (which is the current monthly rent) (...)." (2010, p. 158) In this case

### **Application of Frame Analysis in mediation - Discussion**

A mediator assisting in resolving a collective dispute may have an impact on the process of reaching an agreement, *inter alia*, by reframing the way in which the parties perceive the conditions of a conflict situation in which they find themselves. All conditions are usually very complex and consist of many factors that cannot be exhaustively discussed in a short article. For this reason, attention will be paid to one problem that is quite common in conflicts between unions and employers. It is a conflict of perspectives of perceiving a conflict situation, which can be conventionally called "the need to save face" versus "agreement." In collective disputes, the main problem is often how to come out with a face while making concessions, without which it is impossible to reach an agreement (Konecki 2009). It also happens that one of the parties must completely resign from their position due to incorrect assumptions, or simple misinformation or misinterpretation of data (Moore 2003; pp. 64-65). The need to save face in a situation where, in the common opinion, good negotiators are tough negotiators, becomes a serious problem, the solution of which is the task of the mediator. Sometimes, the parties ask the mediator:

"Has it ever happened that during a collective dispute someone stepped down? If so, then how was it done?" In order to explain the need to make concessions to reach an agreement, the mediator must present a completely new "frame" for the profit and loss assessment, in the context of which giving up some of his interests no longer appears as capitulation to the opponent, but as a necessary price for which a valuable agreement is obtained.

It should be noted that it happens that the parties do not ask the mediator for help in "reframing," but take action themselves that are best interpreted with the help of Goffman's category of "frame fabrication." This happens, for example, when the parties deliberately lead to an escalation of a conflict, in the face of which concessions seem to be the only way to avoid a catastrophe. Then no one can blame anyone for being "soft" in the face of so much pressure. An example can be the management of a public hospital that led the nurses to go on a hunger strike. The concessions made in this situation seem permissible and the ownership authority, such as the Marshal's Office, knows that the employer made a "rational" decision and did not show a lack of assertiveness. The employer could make concessions earlier, thus avoiding a protracted conflict, but then would face the accusation of extravagance on the part of his supervisor. This is a typical "dramatisation of activity" as understood by Erving Goffman (1997, pp. 10-46).

### **Conclusions:**

1. As understood by Erving Goffman, the frame analysis is a good method to be used in qualitative research on the course and resolution of an organisational conflict.
2. Each change of frame in an individual's experience is a kind of "rite of passage" in the sense introduced by Victor Turner and Arnold van Gennep, and as such it is often associated with strong emotions. Passing through the liminal state is sometimes traumatic, other times euphoric, but never emotionally neutral.
3. The role of the mediator is, inter alia, to ensure appropriate management of emotions associated with the change of the frame, so that the "liminal" period necessary to change the perspective/frame is not longer than necessary.
4. The mediator should understand the "fabrication of frames" activities undertaken by the parties to the conflict in order to allow for "useful fabrications" and to prevent dysfunctional "fabrications," which are most often mere manipulations.
5. Although the framing and reframing concepts have constructivist and cognitive origins, it does not mean that they must lead to cognitive relativism in the postmodern sense.

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# ARE SMALL AND MEDIUM ENTERPRISES REALLY INTERESTED IN IMPLEMENTING SUSTAINABILITY ORIENTED INNOVATION?

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## Abstract

**Purpose:** In view of the ongoing economic transformations and growing environmental threats, one of the directions of innovation development is sustainability. In this approach, the focus is shifted from understanding innovation not only as an economic benefit, but also to increase social welfare and protect the environment. Innovations taking into account economic, social and environmental factors are referred to as Sustainability-oriented Innovation (SOI). The development of SOI for Small and Medium-sized Enterprises (SMEs) is of particular importance, as they play a key role in economic development mainly due to quantitative dominance, employment and contribution to GDP. SMEs are entities with a weaker market position than large companies, because they are not only more susceptible, but above all more exposed to changes in the environment. Literature highlights SMEs' limitations e.g. resource constraints, lack of formalized planning, difficulty to attract finance, which may prevent them from engaging proactively in the innovation process. Due to the necessity to quickly adapt to the changes taking place, these organizations are highly mobile and flexible. SMEs are not simply smaller versions of their larger counterparts (Tilley, 2000) and they will innovate differently for sustainability (Moore & Manring, 2009). The view that sustainable development is becoming one of the competitive priorities for smaller enterprises is more and more communicated. The purpose of the study was an attempt to answer the question of whether SMEs are really interested in implementing SOI into their innovative activity strategies and to identify the selected opportunities and challenges related to this process. The theoretical aspects of SOI were discussed, taking into account economic, social and environmental dimension.

**Design/methodology/approach:** To develop the conclusions presented in the article, data from a study conducted by the Polish Agency for Regional Development (PARP) in December 2020 using the Computer Assisted Web Interviewing (CAWI) method on a group of 370 enterprises from the SME sector (start-ups), which operated not longer than 5 years, was used. The study concerned the adaptation and identification of the surveyed enterprises with trends in various time perspectives. In addition, the study uses the results of research conducted by Longitude, a division of The Financial Times commissioned by Smurfit Kappa in January 2020 among 200 British business leaders and senior managers. The premise of the study was to assess attitudes and approaches to sustainable development in the FMCG, retail, e-commerce and consumer products sectors.

**Findings:** Innovations turned out to be a response to the identified trends and progressive civilization changes. Environmental and social changes made consumers change their habits and take advantage of new opportunities. In the face of exhausting resources, many entities are inclined to implement innovative solutions which, in the face of economic changes, turn out to be a necessity. Sustainable development is an increasingly growing area in which the development of new products and services is focused. The adaptation of enterprises to the identified trends in the shorter and longer term allows for the perception of new economic needs, which in turn creates new areas for the development of SOI.

**Key words:** Sustainability-oriented Innovation, Small and Medium Enterprises, sustainable development, innovation.

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### Conceptual framework of SOI

The definition of Sustainable development was established first in the 1987 United Nations' publication "Our Common Future" and means the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). It further pointed out that "Technologies are needed that produce 'social goods', such as improved air quality or increased product life, or that resolve problems normally outside the cost calculus of individual enterprises, such as the external costs of pollution or waste disposal." Since the 1990s, innovation with the aspiration to create positive environmental impacts has been studied under the terms "eco-innovation" (Fussler & James, 1996), "environmental innovation" (Oltra & Saint Jean, 2009) and "green innovation" (Schiederig, Tietze, & Herstatt, 2012). The debate has developed to include social criteria in addition to environmental ones; and has been carried forward under the terms "sustainable development innovation" (e.g. Hall, 2002), "sustainable innovation" (e.g. Wuestenhagen, Hamschmidt, Sharma, & Starik, 2008), "sustainability-related innovation" (Wagner, 2008), "CSR-driven innovation" (Hockerts, 2009) and "sustainability-driven innovation" (Little, 2005). The notion of Sustainability-oriented Innovation (SOI) subsumes these concepts to describe the integration of "deliberate management of economic, social and ecological aspects" (Klewitz & Hansen, 2014) in innovation. Klewitz and Hansen build on the idea that innovation for sustainability is about relative improvements in comparison to a prior or other entity. The term "Sustainability-oriented Innovation (SOI)" is more suitable because it is considered as the process or direction toward sustainability which calls deliberate management (Hansen & GroBe-Dunker, 2013).

Implementing SOI requires three interrelated concepts of sustainable development: social sustainability, economic sustainability and environmental sustainability (Purvis, Mao & Robinson, 2019). In the discussion about SOI, three broad positions can be distinguished on the relationship between sustainable development and innovation (Fichter, Noack, Beucker, Bierter & Springer, 2006):

- Ecologic and ethical considerations can hinder innovation;
- Deteriorating environmental quality increases the pressure to innovate;
- The guiding principles of sustainable development generate ideas and are a source of competitive advantage.

The creation and implementation of an SOI requires strategic management to identify, create and strengthen the links between social and environmental performance and business success. Effective implementation of the principles of sustainable development requires taking actions also in the area of organization, processes and the development of new products and services. In each of these areas, the company must change its tactical approach to a strategic one that is integrated with its operations.

## **Opportunities and challenges for implementing SOI**

As part of the analysis of the possibilities that may favor the implementation of SOI in the strategies of SMEs, there are changes that take place in the closer and more distant environment of the enterprise. They mainly concern economic, political, legal and social changes. External transformations are independent of the company and concern the general economic situation and international trends in the world, which are reflected in national regulations. The key global program (plan) of sustainable development is the United Nations 2030 Agenda for Sustainable Development (United Nations. Transforming our world: the 2030 Agenda for Sustainable Development, 2015). Agenda 2030 introduces 17 Sustainable Development Goals (SDGs), aim to tackle economic, social and environmental issues that plague the world and to promote the concept of sustainability. The concept of sustainability discussed by policy makers and decision makers, academics and experts is now part of almost all political agendas in which a variety of goals and targets have been set in order to make the world a more sustainable place for everyone. Promoting the idea of sustainable development and growing awareness of pursuing long-term goals is an opportunity for many companies to be first and build a competitive advantage based on SOI. When analyzing the challenges faced by enterprises in the context of the implementation of SOI, the observation that comes to the fore is that SMEs occupying their place in the supply chain, often as suppliers and subcontractors, increasingly feel the pressure to monitor activities in accordance with the supplier code for sustainable development.

In order to find themselves in a constantly changing world, entrepreneurs need to notice and understand the changes taking place. Especially for smaller enterprises with greater flexibility, multi-dimensional and quick adaptations can be a source of competitive advantage. One of the motivators for introducing changes in the enterprise is the knowledge of trends and translating them into proposed services, products and solutions. The study conducted by PARP (Jędrzejowski, 2020) shows that, within the current trends, the surveyed entrepreneurs identified themselves to the greatest extent with the trends related to the growing awareness of consumers. As part of the trends that are currently disseminated on the market, there is a noticeable increase in the awareness of enterprises in the economic, social and environmental dimensions. Conscious consumerism was indicated by 43% of respondents. It refers to the growing awareness of consumers and the appropriate creation of products by brands. 34% of the surveyed companies confirmed that they identify themselves in the social awareness trend, within which a conscious society is built - having knowledge and the ability to think critically. Every fourth respondent identifies himself with the Eco conscious trend, in which the public is increasingly aware of our destructive impact on the planet. This trend includes activities aimed at counteracting the advancing consumerism and materialism. The Eco conscious trend is in line with the assumptions of the Eco-Socially Conscious Consumer Behavior (ESCCB) concept. Consumer ecological behaviours are conceptually similar to social behaviours as both pertain to a wider domain – ethical behaviour (Eagle & Dahl, 2015; Kumar, Rahman, & Kazmi, 2013). Social and ecological behaviours

lead to sustainable consumer behaviours. Sustainability is a micro/macro concept that asserts the importance of sustainable development by focusing on marketing practices, and addresses the interdependence of sustainability with individuals, communities, institutions, societies, stakeholders, and consumers, including future generations (Belz & Peattie, 2012). Hence sustainable behaviour embraces a wider perspective explicating how consumption can be regulated by norms to protect the environment and conserve natural resources (Saleem, Eagle, & Low, 2018).

The cited studies show that consumers are beginning to see the far-reaching consequences of their choices. In turn, the growing social and environmental pressure of consumers translates into the actions of enterprises to create innovative solutions based on the concept of sustainable development. Moreover, a company whose mission is based on environmental values and ethical standards inspires greater trust among customers and investors, and for many of them the financial credibility of the organization depends on its social credibility. In purchasing decisions, customers are increasingly guided by the origin of products and the responsible management of suppliers. The role of stakeholders who expect smaller enterprises located in local communities to be involved in social and environmental activity should also be emphasized. Pressure from customers, investors and stakeholders is one of the key drivers of innovative actions for sustainable development.

### **Sustainability – the path of no return**

Research carried out by Smurfit Kappa (Report, 2020) shows that 83% of the surveyed companies describe sustainability as an opportunity for the company to be seized, 72% of companies say that sustainable development is a permanent trend, while 74% of companies say that they do not it will wait for competitors to raise stakes before they can define their own benchmark for measuring success. In about one third of the surveyed companies, sustainable development is behind all research and implementation (37%) and the introduction of new products (33%). The surveyed companies also indicated the factors that have the greatest impact on their sustainable development strategies. For nearly half of the enterprises, reducing waste has become a priority in their sustainable development strategy (49%). This fact is of particular importance in the case of production companies that use more raw materials, which may or may not be renewable. The introduction of new solutions in the field of waste reduction may also contribute to obtaining significant economic benefits for SMEs. It is becoming more and more common to monitor what is happening in the supply chain in terms of involvement in the protection of biodiversity or taking pro-ecological activities. The sustainable development strategy in the surveyed enterprises is also influenced by concern for climate change (41%), and cost reduction (35%) came in third place. Almost one in three companies (27%) indicated that it is customer pressure for greener practices and products that has the greatest impact on sustainable development strategies. At the same time, the attitude of enterprises towards activities in the area of sustainable development as a long-term investment, not as a cost, draws attention. 82% of directors of the surveyed

companies agree with this statement. This approach also changes the rules of financial statements in almost three-fourths of companies (73%). Sometimes measurements can make difficult trade-offs. The introduced innovation may help to reduce waste and litter, but at the same time contribute to climate change. 42% of companies declare that trying to quantify the results of sustainable development is the biggest barrier to the implementation of sustainable practices.

In the opinion of the surveyed companies, the key point of reference in innovative activities aimed at sustainable development are the customer's feelings. Nearly three-quarters (73%) of companies say the sustainability program is changing the way they track and measure financial performance. About six out of ten companies (58%) say customer experience and/or satisfaction is their best way to measure sustainability in a company. Another important metric used to measure the return on investment from sustainable practices is the success of new, sustainable products and services. Conscious consumerism also changes the dynamics between the customer and the brand. 88% of companies say that consumers expect transparent sustainability practices, and more than three-quarters (78%) believe that their customers expect them to lead them to more sustainable practices. An important emphasis on the conclusion of the research is the fact that 63% of companies claim that customers are behind their approach to sustainable development. Half of the companies believe that greater customer awareness of companies' sustainable practices would have the best long-term impact on them. A sustainable transformation, as faced by many businesses, will go beyond harm reduction, renewal and replenishment of the planet. Introducing innovations based on sustainable development to the offer of companies will help to maintain a balance between sustainable practices and profitability.

## **Conclusions**

The analysis of the presented opportunities and challenges allows to outline a few guidelines that should be adopted by SMEs on the way to achieving sustainable innovation. Each company should find its own way of SOI, which will be closely related to its business, market maturity, the situation in the company's environment, place in the supply chain and other factors. The research shows that companies are increasingly responsible for their impact on society and the environment. The development of SOI in SMEs can contribute to solving problems in these areas, which can directly translate into the company's position. The high awareness of young companies about the existing and emerging trends is also optimistic. Society is changing and becoming more demanding towards the organization, which translates into the need for continuous improvement of processes and products. The advantages of SMEs in this respect are greater flexibility and faster adaptation to changes, including emerging economic crises. The introduction of SOI as a permanent element of the innovation strategy may not only be a catalyst for adaptation processes to the new situation, but also increase its ability to influence the environment.

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## ECOLOGICAL AGRICULTURE AS A FORM OF SUSTAINABLE ENTREPRENEURSHIP ON SOIL

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**Abstract:** Agriculture is a process which should provide a sufficient quantity and quality of foodstuffs for the domestic or foreign market. During its development it has undergone many changes which originated predominantly from the scientific-technical progress in the society and climatic changes. Apart from the foodstuff production, the agriculture executes also the ecological, landscape and social function. Agriculturalists have a significant impact on the environment in which they operate. This impact can be both positive and negative. The negative effect on the natural environment is caused by the excessive utilization of pesticides and commercial fertilizers, production of greenhouse gases, or the excessive irrigation and other interferences into the environment. The ecological agriculture constitutes the alternative to the conventional farming on soil. It represents one of the forms of the sustainable entrepreneurship in agriculture. Apart from the production of fresh and healthy foodstuffs, the ecological agriculture strives to eliminate the negative impacts of agriculture on the environment. The priority is not the quantity, but quality. The ecological function is superior over the economic one. In our paper we analyse the selected aspects of the ecological agriculture in the Slovak Republic.

**Key words:** agricultural soil, ecological agriculture, mineral fertilizers, pesticides, sustainable agriculture.

### Introduction

For a long time a man earned living by hunting animals or picking berries in the nature. Agriculture ranks among the oldest activities of a man. It originated about 11,000 years ago in the Middle East and allowed the human community to settle permanently at one particular place. Agriculture was spread from the Middle East to other areas and it reached our territory through the Balkans. At that period people acquired the soil for their settlements and fields by grubbing and annihilation of forests. During the long era agriculture went through the difficult development, which depended always on the climatic conditions of the particular area and the development of technologies. Nowadays, just technologies have a significant impact on all spheres of the industrial production and also agriculture. Now, the automatic milking installation serve not only for milking of the farm animals but they contain also the sophisticated information system generating the enormous data which are used for the successful managerial animal husbandry. Similarly, the usage of drones or modern combine harvesters with the different electronic systems is not unusual. Despite of the alleged progress, the primary role of agriculture remains to provide the sufficient quantity of high quality foodstuff for the domestic or foreign market. This fact emphasizes the essential mission of agriculture on one hand, on the other

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hand, the agricultural basic industry has also the negative impact on the environment. A high level of intensity endangers the quality of soil and other components of environment. The negative effect of agriculture on the environment has predominantly the production of methane in the process of cattle breeding and the excessive utilization of pesticides in the plant production.

The reaction to the deterioration of the environment is the strategy of the European Commission the European Green Deal for 2021 – 2027. This strategy comes from the principal EU objective in the sphere of environment, i.e. the achievement of the climatic neutrality until 2050. This long-term target means that till 2050 the pure emissions of greenhouse gases, produced by the member states of the EU, will equal zero. It involves several areas, including also the biodiversity protection, sustainable agriculture and the ways of provision of the sustainable food web entitled "Farm to Fork, F2F". The central idea of this approach within the Green Deal is to point out to a new and better equilibrium between the nature, food systems and biodiversity, to protect health and high quality living conditions for our citizens, and at the same time to increase the competitiveness and resistance of EU. According to this philosophy the European foodstuff must be safe, nutritional and of high quality, and the food production must have the minimal impact on the nature. 40 % of the budget of the Common Agricultural Policy should contribute to the measures in the area of climate. In agriculture it refers mainly to the decrease of pesticides usage by 50 %, the reduction of nutrition loss in the agricultural soil by 50 %, the restriction of fertilizers usage by 20 % and the increase of ratio of agricultural soil cultivated in the ecological way to 25 %. All these objectives are planned till 2030.

The objective of the paper is the evaluation and development analysis of the selected indicators of ecological agricultural production in the Slovak Republic. The article summarizes these indicators and affords a new view of the ecological agriculture, predominantly from the aspect of the ratio indicators.

## **Literature review / Research Background**

The ecological agriculture originates from the biological approach where the nature constitutes the consistent entity. Its aim is the sustainable and ecologically balances agricultural system producing high quality foodstuffs. The market output of the ecological agriculture are foodstuffs. In order to apply them successfully on the market it is required to know the needs, possibilities and interest of consumers (Kretter 2005, p. 7).

In the protection of environment the agriculture also plays a significant role. Apart from the traditional production function it executes other, equally important functions, i.e. social, societal as well as landscape ones (Horská, Nagyová at all, 2013, p. 7).

The fundamental factor of the sustainable farming on soil is the competitiveness of the agricultural producers. Here the decisive role is played by the remittance of costs by the prices of commodity outputs and other compensations usually from the

public funds. These funds settle the costs of non-commodity outputs (environmental services), which so far cannot be evaluated via market (Blass, Bielek, Božík. 2010, p. 8).

The ecological farming brings higher revenues for commodities to agriculturalists, on the other hand, it means lower yields, more profound registration of activities or the necessity of usage of slower, mechanical weed-control in comparison with faster application of the chemical preparations (4).

The European Commission enforces sustainability in agriculture and rural areas across EU through the Common Agricultural Policy. (CAP). The CAP aims to ensure that agriculture and forestry in the EU is socially, economically and environmentally sustainable. The transition to sustainable agriculture in the EU is driven by new technologies, research and innovation, and the spread of knowledge. The CAP sets out to tackle climate change, protect natural resources and enhance biodiversity in the EU (European Commission, 2021).

As of the end 2019, 16.5 million hectares of agricultural land in Europe (European Union: 14.6 hectares) were managed organically by over 430,000 producers (European Union: almost 344,000). In Europe 3.3 percent of the agricultural area was organic (European Union: 8.1 percent). The countries with the largest organic agricultural areas were Spain (2.4 million hectares), France (2.2 million hectares) and Italy (2.0 million hectares). In twelve countries, at least 10 percent of the farmland was organic: Liechtenstein has the lead (41.0 percent), followed by Austria (26.1 percent) and Estonia (22.3 percent). Retail sales of organic products totalled 45.0 billion euros in 2019 (European Union: 41.4 billion euros) (FiBL&IFOAM Organics International, 2021).

## **Methodology**

In the paper the methods of analysis, synthesis, comparison and simple mathematical and statistical methods have been used. The required data have been acquired mainly from the secondary sources of the Ministry of Environment and Ministry of Agriculture and Rural Development of the SR, and the Statistical Office of the SR.

## **Results**

Agriculture has a significant impact on the environment not only by its landscape function but it affects also soil, water and atmosphere. The agricultural production can be based on the conventional, environmental, ecological, sustaining or combined principle. The agricultural activity causes soil degradation, emissions of greenhouse gases, waste generation and pollution of atmosphere and releasing of sewage water. Recently, in the agricultural sector we can observe the movement from the market oriented conception towards the conception of the sustainable marketing, which apart from the economic growth emphasizes also the long-term effects that have been caused by the agricultural activity in the environment. The priority is the preservation

of biodiversity of the whole system and prevention of its degradation. As in some regions the traditional form of conventional agriculture seems to be unattractive and uneconomic, nevertheless, it is necessary to retain and cultivate the landscape, therefore, in these areas it is appropriate to concentrate on some of the alternative forms of the agricultural production. One of them is the ecological agriculture as a way to secure the sustainability of the regions. The ecological agriculture is the system that respects the life cycle of the natural systems and provides the quality, healthy, fresh, tasty and genuine foodstuff to the consumers. The rules of the ecological agricultural production in the Slovak Republic are being regulated by the Act No. 282/2020 Collection of Laws on the ecological agricultural production, which has amended the original Act No. 189/2009. The ecological agriculture is the area of the agricultural production which develops rapidly in the EU countries, including Slovakia. This development constitutes the consequence of the increased consumers' interest in bio food, and also the response to the changes in the field of environment. From the January 1, 2022 EU will introduce new regulations targeted at the effectiveness in this sphere. There will be also new rules for the producers that simplify the transition to the ecological production for small farmers and reinforce the system of controls in order to build consumers' trust in the system of ecological agricultural production.

In 2019, the EU's total area of farmland under organic production grew to 14.6 million hectares. Compared to 2018, the number of organic producers in the EU increased by 5.1% to 343,858. A significant growth of the EU's organic retail market accompanies this development, rising by 12% to 41.5 billion EUR. Between 2010 to 2019, the value of the EU's organic market more than doubled (IFOAM Organics Europe, 2021).

The development of the selected indicators of the organic agriculture in Slovakia in 2003 – 2019 is indicated in the Table 1. The table records the development of size of ecologically cultivated soil, number of farms of the ecological agriculture and the average size of these farms. As the table indicates the first three evaluated indicators show the rising trend, and the average size of farms is falling. The area of ecologically cultivated agricultural soil (including the areas in- conversion) was increased from 54, 479 ha to 196, 210 ha, which is the growth by 141,731 ha. Even more significant rise was recorded with the ratio of ecologically cultivated agricultural soil out of the total area of the agricultural soil. In 2003 in Slovakia 2.20 % of agricultural soil was cultivated ecologically, in 2019 it was 10.24 % out of the total area, which was the growth 8.04%. The objective is to achieve the level of min. 13.5 % till 2030. The most considerable increase is evident in the number of the farms using the principles of the ecological agriculture. In 2019 there were 567 farms, in 2003 only 88, which is the growth by 479 farms. The average area of the farm is decreasing. From 2003 to 2019 this fall was 273.1 ha.

**Table 1. Development of selected indicators of ecological agriculture**

<b>Year</b>	<b>Area of ecologically cultivated agr. soil (ha)</b>	<b>Ratio of total agr. soil (%)</b>	<b>Number of farms of ecological agriculture</b>	<b>Average area of farms (ha)</b>
2003	54,479	2.20	88	619.1
2004	65,400	2.18	131	499.2
2005	92,191	4.93	210	439.0
2006	121,956	6.42	256	476.4
2007	123,819	6.52	280	442.2
2008	136,669	7.25	349	391.6
2009	146,762	7.50	385	381.2
2010	178,235	9.23	410	437.7
2011	180,261	9.34	364	495.2
2012	168,602	8.43	362	465.7
2013	162,029	8.40	341	475.2
2014	180,365	9.39	399	452.0
2015	186,483	9.70	416	448.2
2016	187,010	9.75	430	434.9
2017	189,147	9.90	439	430.9
2018	192,143	10.02	535	359.1
2019	196,210	10.24	567	346.0
Index 19/03	3.60	4.65	6.44	0.59

Source: Author`s processing according to the data of the Central Control and Testing Institute in Agriculture

The Table 2 describes the development of the total used arable soil and the ratio of the soil registered in the ecological system of agriculture (ESA) in

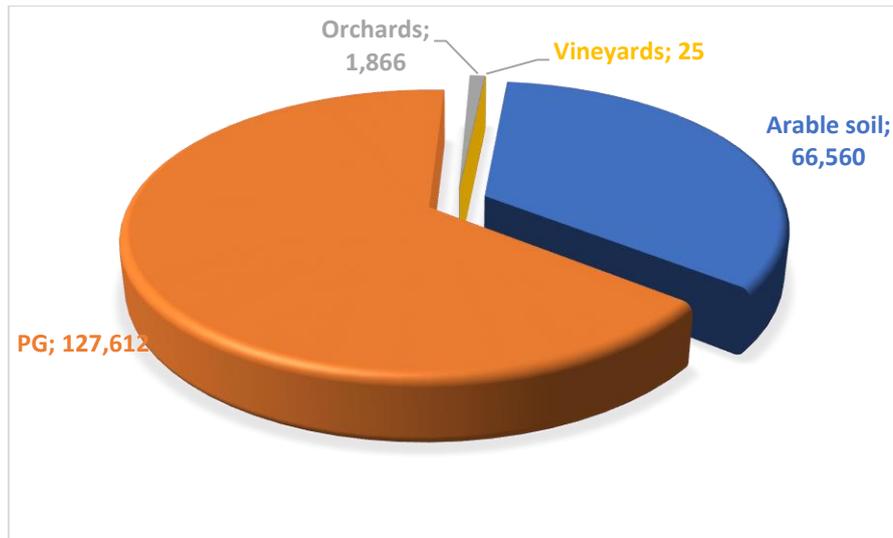
2012 – 2019. We evaluate the similar development also with the permanent grasslands (PG). The area of the total used arable soil decreased by 11, 060 ha (1 %). The territory of the arable soil registered in the ecological agricultural production (EAP) was increased from 54,264 ha to 66,560 ha (growth by 23 %). Out of the total arable soil the ecological agricultural production constitutes 4.93 %. The permanent grasslands registered in the ecological agricultural production achieved a higher ratio of the total permanent grasslands in the whole evaluated period. In the last evaluated year this ratio was almost 25 %. The total are of these premises is relatively stable. In 2019 the level achieved 518,415 ha, during the whole period it increased by 14,544 ha (1 %).

In 2019 the average ratio of the soil under ecological cultivation in the EU was 8.5%. From this aspect Slovakia has more soil under ecological cultivation (by 1.74%) than the average of the EU. According to the strategy "From Farm to Table" the ratio of this type of cultivation should be increased to 25% in 2030. Nowadays, only Austria achieves this level out of the EU member countries. In order to achieve this objective the Council of EU promised to provide 20% of the direct payments for the ecological regimes.

**Table 2. Development of areas of agricultural soil according to the type of plot**

<b>Year</b>	<b>Used arable soil in total (ha)</b>	<b>Arable soil in EAP (ha)</b>	<b>Arable soil in EAP (%)</b>	<b>Permanent grasslands in total (ha)</b>	<b>Permanent grasslands in EAP (ha)</b>	<b>Permanent grasslands in EAP (%)</b>
2012	1,359,979	54,264	3.99	514,942	113,075	21.96
2013	1,362,002	53,181	3.90	513,704	107,622	20.95
2014	1,359,091	62,279	4.58	510,801	116,528	22.81
2015	1,350,180	60,890	4.51	520,581	123,855	23.79
2016	1,347,293	60,302	4.47	521,441	124,807	23.94
2017	1,342,885	62,978	4.69	517,679	124,230	23.80
2018	1,348,019	64,821	4.81	523,552	125,366	23.95
2019	1,348,919	66,560	4.93	518,415	127,619	24.62
Index 19/12	0.99	1.23	1.24	1.01	1.13	1.12

Source: Author`s processing according to the data of Green Report



**Figure 1. Agricultural soil registered in ESPA in 2019 according to the type of plot (ha)**

Source: Author`s processing according to the data of Green Report 2020

The area of ecologically cultivated agricultural soil according to the type of plot in 2019 is indicated in the Figure 1. In the long term the highest ratio is represented by permanent grasslands which created 65.0 % out of the total area of ecologically cultivated agricultural soil, followed by arable soil (33.9 %) and orchards (1 %). The area of the ecologically cultivated vineyards was neglectable (25 ha). These data indicate that the permanent grass covers (meadows and pastures) can most easily be ecologically cultivated. On the other hand, it is very difficult to cultivate ecologically vineyards, and at the same time to achieve the positive trading income. The same situation is related to fruit growing. In Slovakia the permanent grass covers are being used predominantly for sheep breeding, therefore in this category of farm animals the ecological approach prevails.

In this part we analyze the selected indicators of the animal husbandry of the ecological agricultural production (EAP). The Table 3 involves the development of the numbers of the farm animals registered in EAP in 2012 – 2019. The table indicates sheep, cattle, poultry, goats, pigs, horses and the total number of animals. It also includes the animals in-conversion. The Table 4 shows the percentage representation of the individual categories of farm animals of the total number of animals in the particular category. In the total evaluation the highest number was achieved by sheep. The number of sheep raised in EAP was decreased by 10,372 pieces (10 %). Sheep grown ecologically form 30.2 % out of the total number of sheep raised in Slovakia. The number of cattle was increased by 20,951 (48 %). Out of the total number of cattle almost 15 % are raised in EAP.

**Table 3. Development of number of farm animals according to the types raised in EAP (pieces)**

<b>Year</b>	<b>Sheep</b>	<b>Cattle</b>	<b>Poultry</b>	<b>Goats</b>	<b>Pigs</b>	<b>Horses</b>	<b>Total</b>
2012	107,327	43,293	8,849	2,052	146	611	162,278
2013	106,713	43,142	8,708	1,979	187	659	161,388
2014	96,976	44,772	8,250	1,005	175	569	151,747
2015	97,239	58,945	4,110	1,527	503	643	162,967
2016	93,596	65,724	5,311	1,429	438	590	167,088
2017	102,000	61,655	4,111	1,349	164	541	169,820
2018	84,912	63,340	5,340	1,419	547	541	156,099
2019	96,955	64,244	6,316	1,814	732	529	170,590
Index 19/12	0.90	1.48	0.71	0.90	5.01	0.87	1.05

Source: Author`s processing according to the data of Green Report and Statistical Office SR

**Table 4. Ratio of selected categories of farm animals raised in EAP out of the total number of animals (%)**

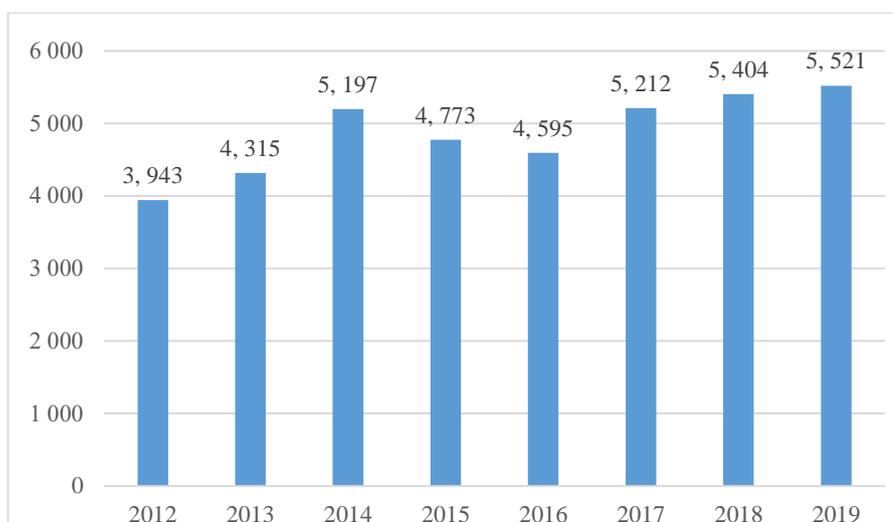
<b>Year</b>	<b>Sheep</b>	<b>Cattle</b>	<b>Poultry</b>	<b>Goats</b>	<b>Pigs</b>	<b>Total</b>
2012	26.2	9.2	0.1	5.9	0.0	8.28
2013	26.7	9.2	0.1	5.6	0.0	8.32
2014	24.8	9.6	0.1	2.9	0.0	7.48
2015	25.5	12.9	0.0	4.2	0.1	8.54
2016	25.4	14.7	0.0	3.9	0.1	8.82
2017	27.9	14.0	0.0	3.6	0.0	9.10
2018	24.2	14.4	0.0	3.8	0.1	8.50
2019	30.2	14.9	0.1	5.1	0.1	10.08
Index 19/12	1.15	1.62	1.00	0.86	-	1.22

Source: Author`s processing according to the data of Green Report and Statistical Office SR

We can observe the decrease of the number of poultry, goats and horses. The number of poultry and pigs raised in EAP represents only a small ratio (0,1 %) out of the total number of these categories. The figure of pigs fluctuates, in the whole evaluated period there was fivefold growth of their number. The total number of animals grown in EAP recorded the increase by 8,312 pieces (5 %). A higher growth is evident in the ratio of animals raised in EAP out of the total number of farm animals (10 %). This trend is caused not only by the growth of the total number of animals raised in EAP, but also by the continuous fall of the total number of farm animals grown in Slovakia.

In this part we will focus attention on the negative impacts of agriculture on the environment. We will evaluate the development of consumption of pesticides and mineral fertilizers. The pesticides are the preparations used in agriculture for the crop protection against the animal and plant pests and fungal diseases. From 1990 the usage of pesticides and mineral fertilizers has been decreasing. This tendency was stopped in 2005 and from this year there has been recorded the growth.

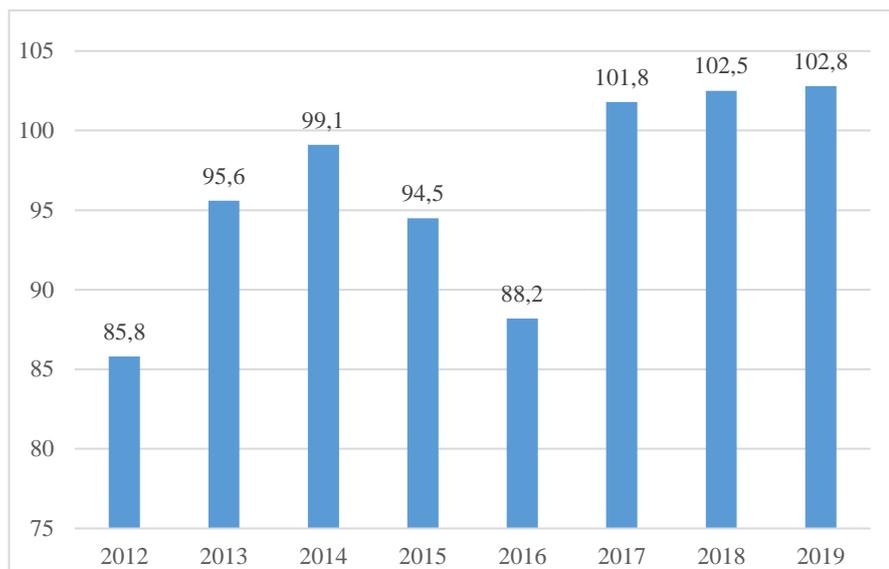
The development of the total consumption of pesticides in agriculture in SR in 2012 – 2019 is indicated in the Figure 2. The usage of pesticides is being increased continuously and in the evaluated period it was risen by 1,587 tonnes. In 2019 out of pesticides mostly herbicides were used (2,679 t), 1,265 t fungicides, 475 t insecticides, 422 t fungal and insecticidal disinfectants and 680 t of other pesticides. According to the plans of the EU the utilization of pesticides should have been decreased by a half until 2030. According to the authors of this paper, the achievement of this objective will be difficult, as the usage of pesticides was growing in the most EU member states in 2011 - 2019. The decrease was monitored only in seven countries, Portugal was in the lead (drop by 42 %).



**Figure 2. Development of consumption of pesticides in agriculture of SR in 2012 – 2019 (t)**

Source: Author`s processing according to the data of the Central Control and Testing Institute in Agriculture

The consumption of the mineral fertilizers (NPK) in kilograms of the pure nutrients per hectare of the agricultural soil in SR during the period 2012 – 2019 is indicated in the Figure 3. In 2021 it was 85.8 kg.ha<sup>-1</sup>, in 2019 102.8 kg.ha<sup>-1</sup>, which means the growth by 17.0 kg.ha<sup>-1</sup>. The lowest usage was monitored in 2016 (88.2 kg.ha<sup>-1</sup>).



**Figure 3. Development of consumption of mineral fertilizers in agriculture of SR in 2012 - 2019 (kg.ha<sup>-1</sup>)**

Source: Author's processing according to the data of the Central Control and Testing Institute in Agriculture

## Conclusion

The primary mission of agriculture is to provide the sufficiency of secure and high quality foodstuff needed for the nutrition of the population. For a longer time the emphasis is placed also on other extra-productive functions of agriculture. The most significant ones are the provision of the sustainable utilization of the natural resources and preservation of vigorous countryside. The idea of the sustainable development in agriculture is met by the ecological agriculture, which represents the alternative conception of the agrarian policy and strives for the continuous production of the healthy foodstuffs in the way which is environmentally friendly.

The interest in the organic form of farming on soil is being increased constantly. In 2019 the area of ecologically cultivated agricultural soil achieved 196,210 ha. Out of the total agricultural soil it is more than 10 %. According to the type of plots the highest rate of ecologically cultivated areas are the permanent grassland (127,612 ha) and arable soil (66,560 ha). The total number of the registered producers was 859, farmers 567. We can see the constant growth also in these indicators.

The increase is evident also in the total number of animals raised in EAP. The total growth is 8,312 pieces (5 %). The highest number is achieved in growing sheep, followed by cattle. The ratio of pigs and poultry is very low. Out of the total number of raised animals more than 10 % is grown in the ecological breeding.

The agriculture effects the environment in the different ways, including the usage of pesticides and mineral fertilizers. In 2019 the total consumption of pesticides in agriculture was 5,521 tonnes. In comparison with 2012 there was the growth by 1,587 tonnes (40 %). We can record also the growth in the development of the usage of mineral fertilizers. In 2012 it was the lowest level (85.8 kg.ha<sup>-1</sup>), in 2019 it achieved the highest number 102.8 kg.ha<sup>-1</sup>). In total there was the growth by 17 kg.ha<sup>-1</sup>, (20 %).

The organic agriculture ranks among the alternative ways of farming on soil with a great perspective of the further development arising from the urgent needs of the society and increased demand for bio-foodstuff. In the future period the faster development of ecological agriculture in EU and Slovakia can be facilitated by the Common Agriculture Policy with the subsidies for this form of farming on soil.

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# FAST FASHION AND SUSTAINABLE DEVELOPMENT

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**Abstract:** Approximately half of the world's clothing production is made from cotton, the cultivation of which irreparably damages the planet. In today's hectic times, when business processes are gradually accelerating, the concept of fast fashion is increasingly appearing in the textile industry. The consequence of this trend is the above-average production and consumption of clothing. To find out the results, qualitative research was carried out, in-depth interviews as well as quantitative research. The questionnaire survey was performed. The quota feature for data collection was age in generations X, Y, Z according to current data from the Czech Statistical Office for 2019. Generations are defined according to Kotler. The questionnaire survey took place in the first quarter of 2020 using an electronic questionnaire in the Umbrella system. For Czech consumers, the most famous representatives mass retailers of fast fashion are H&M, New Yorker, Zara, C&A, Takko, and Pepco. Part of the quantitative research was also testing hypotheses depending on the generation, awareness of fast fashion, frequency of clothing purchases, and clothing recycling. Knowledge of the term fast fashion depends on the generation; this term is understandable especially to the youngest Z generation. The frequency of clothing purchases does not depend on the generation. Also clothing recycling is not generation dependent according respondents. Slow fashion has become a sustainable consumption movement that is the opposite of fast fashion. But the current lifestyle of most people does not lead to slow fashion. In fact, there is a big difference between the ideas of sustainable development and the actual shopping behaviour of the consumers. Based on the result, the attitude of customers and society to the purchase, recycling and disposal of clothes is discussed. The issue of waste over time is also described in the article. These topics are a great challenge for the future of economic entities, the efforts of political representation and, above all, the quality of our lives and the quality of lives of future generations.

**Key words:** consumer behaviour, fast fashion, sustainability, sustainable development, waste

**JEL codes:** L67, P28, Q01, Q59

## Introduction

Fast fashion is a term that in many ways resembles fast food. Fast food as well as fast fashion is a low quality product. Quickly consumed food that consumes a large amount of resources. This brings quick and fleeting pleasure, which is harmful to humans in the long run. Unfortunately, it is also economically profitable in the short term and very addictive for individuals, so it is very difficult to eliminate this phenomenon. The waste that fast fashion represents is constantly increasing. Waste generally characterizes civilization, but society does not like to think about waste, and when it comes down to it, it pretends that waste does not exist. In more and more countries - and not just developed ones - according to many studies, up to 100 percent more waste is discarded than at the turn of the millennium. Many products - including textiles - have a limited lifespan just to speed up the turnover of goods.

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Changing fashion trends is becoming more common. In most stores, clothes are soon sold out or taken to a landfill. Their storage is more expensive than throw away as a garbage or their destruction. Purchased clothes are not repaired, but discarded. The topic of the article is to find out how fast fashion is perceived and whether it is at all possible to mitigate the negative effects that fast fashion causes. As has already been written, people living in a consumer society avoid the issue of waste. However, if humanity wants to live in a sustainable environment, it is necessary to pay more attention to this topic. Especially the younger generation born in times of prosperity is little aware of this problem internally. Although young people are proponents of a green and clean planet, their own consumer behaviour contradicts this, it does not respond.

### **Literature review**

The term fast fashion is relatively new. If there is a topic of waste in the reports, it is most often a topic related to hazardous waste such as nuclear waste. In general, the term fast fashion represents inexpensive, very cheap clothing produced rapidly by mass-market retailers in response to the latest trends. Fast fashion is an easily accessible fashion that is produced in huge quantities regardless of the environment or working conditions of employees. It is a mass production of clothing, where quantity outweighs quality. It is therefore a matter of producing as many pieces as possible at the lowest possible cost, at low prices. Burianová (2016) defines fast fashion as fast-changing trends, not very high-quality products, fast profit generation and alarming working conditions during production. Therefore, production is very common in developing African and Asian countries, where working conditions are very poor - sweatshops. Textile production has shifted from Britain and the United States to countries with the lowest paid labour. At present, this country is Ethiopia, but in an ever-shrinking cycle and rising transport prices, poorer European countries with cheaper labour are also attractive to producers for European markets.

Byun and Sternquist (2008) define four features of fast fashion products: Fast response to consumer wishes and requirements, short product life cycle, fast supply chain operation and low product price. Fast fashion models are designed so that their quality satisfies consumers only temporarily, so according to Kotler (2007), the life cycle curve of fast fashion, even though it is longer and slower, approaches the life cycle curve of the fashion fad.

Fast fashion can also be defined as a business model that clothing chains apply to their strategies. In the early 1980s, this model was adopted by Benetton and Zara, in the late 1990s it grew with advancing globalization, and today it is beginning to become a global problem. According to Lee (2007), the basic characteristics of this business model are a quick response to consumer behaviour, the satisfaction of his needs as quickly as possible and the resulting excessive consumption. New clothes are delivered to stores almost every day and changes in the interior of stores are also very common. According to Frey (2011), merchandising, the presentation of goods, also plays an important role here. Traditional textile shops are in decline; the

popularity of shopping centres is growing. The change in consumer behaviour was also reflected in the value-creating processes of individual companies.

As reported by Henninger et al. (2016) there is no longer a traditional two-season approach and companies have started to produce up to 20 collections a year and also to constantly change vendors. According to Cobbing and Vicaire (2016), new clothing is rarely used, while other consumers are aware of the importance of sustainability in the products, as Muthu states, 2017. The world is beginning to use the term low fashion. This term is defined, for example, by Štefko, Steffek (2018) as a movement that emphasizes respect for both people and nature in the production of clothing, while achieving this through the use of natural materials, local producers and processors, who are paid a proper reward for their work. According study of Chi (2021) female consumers show a more positive attitude toward slow fashion apparel. Rosenbloom (2010) and Gwilt (2012) then write about the phenomenon of zero waste fashion, which tries to approach the minimum volume of textile waste that is generated during the production and use of fast fashion.

## Methodology

The research was focused on the X, Y and Z generations. These generations tend to be defined only approximately, so the division given by Kotler (2007) was chosen. Thus Generation X, born 1964-1978, Generation Y, born 1979-1994 and Generation Z, born 1995-2010. For qualitative research, which took place in the form of hourly in-depth interviews, a proportional number of respondents according to the Czech Statistical Office according to age and gender was determined. There were 8 respondents (4 men, 4 women) in the interviews in each group, a total of 24 people. Also on the basis of their answers, a questionnaire was compiled, which was distributed by the Umbrella system and the data were processed in the Statistica program. A total of 200 questionnaires were completed and processed. The results of the qualitative research and the quantitative survey were very similar. The research took place at the Institute of Marketing and Trade, which focuses on consumer behaviour. Data collection for questionnaires also took place within the project, Ježková (2020). Personal in-depth interviews took place in January 2020, and a non-contact questionnaire survey in January to April 2020, so the results may have been affected by the covid pandemic. Dependence testing was performed using Pearson's Chi-square test, hypotheses were tested at a significance level of 0.05. Processed on the basis of calculations of the Statistica 12 software. The author's own experience from charitable events is also important for the work.

According to the CZ NACE classification, the manufacture of clothing falls into section C, ie the manufacturing industry, division 14. Division 14 "Manufacture of wearing apparel" is further divided into three groups: 14.1 Manufacture of wearing apparel, except fur apparel, 14.2 Manufacture of articles of fur, 14.3 Manufacture of knitted and crocheted apparel. Typical features of this industry are the rapid response of production to seasonal influences in an effort to meet the wishes and requirements of customers. It is a sector with fast-moving production and consumption. Factors influencing the clothing industry include, in particular, cost, quality, fashion and

innovation. The most important is the CZ-NACE 14.1 group, which includes the manufacture of outerwear, leather clothing, underwear, other garments and clothing accessories. The author's own experience from charitable events is also important for the work.

## **Results and Discussion**

During the in-depth interviews, it was surprising that although the respondents were aware of environmental problems and environmental pollution, according to them, the waste of the textile industry represented a completely negligible part of the pollution. Today, on the contrary, the textile industry is one of the biggest polluters of the environment. The concept of cotton acts as something natural for the respondents, friendly to the environment and also to help developing countries. At the same time, cotton is the most chemically treated crop in the world and accounts for at least half of textile production. Cotton is grown on only 2.4% of arable land in the world, yet 24% of the world's consumption of insecticides and 11% of pesticides that cause cancer and other serious diseases are used to treat it.

Toxic substances enter the soil and water and from there into the entire ecosystem. Cotton is demanding on heat and humidity and is grown especially in developing countries, where poor farmers use the cheapest and most toxic substances to be able to survive. A lot of water is also used to make clothes. Cotton is often grown even in areas where it is not raining enough and must be intensively irrigated. Although organic cotton brings significant economic and environmental benefits, it accounts for less than 1% of the total annual harvest worldwide. However, other materials are also environmentally demanding. Artificial materials have brought with them a new problem of long-term decomposition of waste.

Until 100 years ago, in most Western countries, there were children and adults who made a living collecting old rags, bottles and fats - then sold them for processing in factories, especially for paper mills. Today, however, paper is made from cellulose. Carpets were woven from the remains of the textile. Clothes were expensive, hand-sewn, so they were managed many times. There was also almost no packaging. In the USA, even after World War II, clothing was sewn from packaging - bags of flour and bags of animal feed. Also, baby diapers and all sanitary napkins were made of textile and were used repeatedly. The more we consume, the more waste we produce. The ethical qualities of a company are beginning to be assessed according to the method of waste treatment.

There is a certain paradox in the issue of fast fashion. People buy new and new stuff to be different, but at the same time they follow the same fashion trends, the same influencers, to resemble their heroes, their important icons and reference groups. People need to buy new and new clothes to prove their worth in today's stressful world and fill a place in their soul. Especially the younger generation needs to anchor in today's ever-changing world - and fashion can help. Attracting attention through clothing is also a faster way to target the opposite sex. Utilizing the attractiveness of fast fashion is then an easier way than slow fashion. Social networks bombard us every second with new creations that we are unable to prosecute, and

the frustration then manifests itself in the increasingly identified shopholism. Unfortunately, buying new and new clothes evokes only short-term satisfaction, and we get into an endless spiral of buying other and other things. With the onset of the pandemic a year ago, textile stores were repeatedly closed. However, the purchase of clothing on the Internet accelerated, and online marketing campaigns intensified, replacing the traditional shopping channels even for older customers. In the Czech Republic, there are the most e-shops in Europe per capita. In total, there are over 40,000 e-shops. However, this increase has further polluted the environment - through more environmentally demanding logistics and distribution channels and an enormous increase in packaging.

Until 150 years ago, the company lived almost without waste. Things have been used repeatedly around the world. Food, clothes and other goods thrown away by rich people were used by poor people. The family's waste was only ash, urine and excrement. In the last century, with the growth of population and prosperity, there is a change. Mass production from the end of the 19th century, the emergence of packaging technology leads to an unprecedented situation. Waste is something that disrupts order for humans - it is unwanted and disruptive. The transformation of an object into waste is a reminder of the transience of things and life, so we do not like to think of waste. However, the boundary between waste and a usable object is blurred. It all depends on the context. What may be unusable clothing for waste for one person may be attractive and wearable clothing for another person. Waste is the downside of consumption. People who dealt with waste in the past were considered unclean. Waste was and is a concretization of the collective unconscious of a given culture. Today, however, working with waste is a highly valued, professional, technical, technologically advanced activity, increasingly associated with the development of information technology. Due to the amount of waste - without regular waste disposal, civilization would fall into chaos and would not be able to exist.

In the survey, only a third of respondents out of 200 respondents knew the concept of fast fashion. After explaining this concept, respondents were asked about clothing chains that use fast fashion. Most respondents 16% described H&M as a fast fashion chain, followed by New Yorker (10%), Zara (8%), C&A (6%), Takko (5%) and Pepco (4%). In the literature and professional press, it is most often mentioned outside the above, as an example of mass-market retailers is also Primark, which opened in the Czech Republic at the end of June 2021. In connection with the term fast fashion, respondents were asked about GOTS (Global Organic Textile Standard) and WFTO (World Fair Trade Organization) certificates. Knowledge of these certificates was very low. Almost 11% for GOTS and 19% for WFTO. As part of consumers' shopping behaviour, factors influencing purchasing decisions were identified in a questionnaire survey of 200 respondents. Here, respondents stated quality (72%), price (25%), origin of goods (2%), certification of goods (1%) as decisive. A total of 64% stated that they spend less than CZK 1,000 per month on clothing, 2% more than CZK 5,000 per month. According to data from the Czech Statistical Office (2017), the average expenditure per citizen for clothing and footwear is CZK 7,444 per year. For the frequency of clothing purchases, the

answers were very often/weekly 2%. Occasionally, 58% of respondents' shop monthly and 40% say they buy clothes once a year. This did not completely coincide with the question of the last purchase, which will probably be a more accurate depiction of reality, with 13% buying clothes in the last week and 52% in the last month. Results of research are similar to Chi (2021) women show a more positive attitude toward slow fashion apparel.

Hypothesis results for the above mentioned generations X, Y and Z:

Hypothesis A: Awareness of the term fast fashion

H<sub>0</sub>: Knowledge of the term fast fashion does not depend on the generation

H<sub>1</sub>: Knowledge of the term fast fashion depends on the generation

Hypothesis H<sub>0</sub> is rejected because the p-value is 0.003714, the calculated p-value is less than 0.05. The older the generation, the less aware of the term fast fashion,

Hypothesis B: Frequency of clothing purchases

H<sub>0</sub>: The frequency of clothing purchases does not depend on the generation.

H<sub>1</sub>: The frequency of clothing purchases depends on the generation.

Hypothesis H<sub>0</sub> is not rejected, because the p-value is 0.110305. The frequency of clothing purchases does not depend on the generation. The qualitative research showed that the youngest generation Z buys clothes most often for themselves. The older generation then also buys clothes for children and grandchildren.

Hypothesis C: Clothing recycling

H<sub>0</sub>: Clothing recycling is not generation dependent.

H<sub>1</sub>: Clothing recycling is generation dependent.

Hypothesis H<sub>0</sub> is not rejected, because the p-value is 0.649893. Thus, clothing recycling is not dependent on generation.

The historical development of mankind has led to the gathering of things that were never enough. However, the limited space of our dwellings and the desire for order forces us to throw things away. Convenience chooses the easiest way. However, donating clothes does not mean that no waste was generated. From the research of dozens of events in Brno over the last 8 years, a maximum of 20% of donated clothing will be recycled. Due to the costs of transport and especially storage, most of the clothes that we donate to organizations or provide to charity after the event, bazaar, etc. are immediately taken to the bins. Very often it even ends up in unsorted, municipal waste. Even 50 or 30 years ago, we could not imagine the amount of current waste. The world is shrinking, there is a global village, there is nowhere to move waste, to which empty places, waste is still coming back to us. Recycling is a common term for politicians, especially when elections are approaching, and also for organizations applying for subsidies. But the current state of recycling cannot help us save the world. Rich countries buy space in poor countries to store not only nuclear but also municipal waste. The sea is polluted even in the most remote parts. We don't have any free space anymore. According to Siegle (2019) and Zeynep (2017), in 2014 we exceeded the worrying limit and since then we have been producing 100 billion pieces of new clothing a year. Without rapid reforms, the fashion industry, whose main player is fast fashion, could be responsible for a quarter of the Earth's carbon budget by 2050. There are a large number of certificates for recycled clothing and a certain target group is affected by this. But

this again applies to richer countries and only for small group of customers. More and more pieces are marked as a PET bottle product, but these are again just marketing messages, as the efficiency of this recycling is minimal. At the same time, there are recycling programs that are more economically motivated than driven by a real effort to protect the environment.

## Conclusion

The term ecology comes from the Greek word oikos, which means home. And the name of economics comes from the same word base. Ecology seeks to determine the optimal principles of the economy in nature by examining the relationships between the environment and the organism. These laws must be respected, because we do not yet have another environment. Fast fashion contributes very quickly to the pollution of the planet. Growing crops, but also textile processing is very environmentally demanding. From the very beginning of industrialization, it was said that chemicalization was the blood of the economy. The development of the economy depends on the development of chemistry so far. But this has devastating consequences in today's rich society, which lives instantly with instant disposable goods. Despite the fact that the importance of sustainable development is currently being declared, few can voluntarily give up the achievements of civilization and be different-less comfortable in buying and thinking. We are all aware of the importance of recycling, but until waste overwhelms us, these problems are only theoretical for most of the population. Research has shown that the ideas of slow fashion and recycling are attractive to some individuals of the younger generation, but will not change their actual behaviour. For all their waste, people underestimate its size - which also resulted from in-depth interviews, not only in fast fashion. The current reckless huge environmental demands on virtual currency mining resources are proof of this. Fast fashion is very attractive for consumers and a change in human thinking is not realistic in the near future. The ecological efforts of companies in their current form are mostly just a marketing tool to increase turnover and profits. The current waste restrictions set by the European Union are not able to regulate the growth of waste. The questioning of constant growth is only a discussion of philosophers, but not yet of economists or politicians. The question is whether only a catastrophe can save us from real and moral waste in connection with the subsequent strict regulation of state authorities. But so far we can only imagine such a world in movies, but not in reality.

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# HOUSEHOLDS' WASTE MATERIAL MANAGEMENT AND RECYCLING: HOW MUCH CONCEIVABLE TO SUPPORT A ZERO-WASTE MANAGEMENT

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## Abstract

**Purpose:** The paper aims to understand household waste material management and recycling in Rajshahi City Corporation in Bangladesh and how much the city dwellers can support zero-waste management in the future. **Design/methodology/approach:** The investigation was based on a primary survey between 2019 and 2020. Researchers arbitrarily chose 120 family units; respondents were asked to answer a structural questionnaire on households' waste management (HWM), recycling and Perception to attain a zero-waste management goal. The analysis was done through descriptive statistics and logistic regression models. **Findings:** The respondents have a sound understanding of the health consequences of waste-related pollution. The logistic regression models demonstrated that education and awareness of households are positive and significantly related to recycling. **Research limitations:** Difficulties in looking at a randomly chosen holding number and the unwillingness of the household members to clarify their genuine pay level were the few troubles in the research. **Practical implications:** The study reveals that 88 % of the respondents were known to HWM beforehand, and 54% concurred to see a moderately vibe of local ambience compared to the past five years. **Social implications:** Our study would motivate to attain zero-waste management in the Rajshahi city in future as the households welcomed an approach of recycling, reducing or refusing to buy things with lots of packaging.

**Keywords:** Recycling, Household Waste Management, Logistic Regression Model, Rajshahi City Corporation.

## Introduction

The importance of caring for the environment is becoming increasingly crucial in Bangladesh for a variety of reasons. On the one hand, as a developing nation, there is rapid industrialization and urbanization; on the other hand, balancing a population of 166.3 million with a fast growth rate is a challenge for the country. However, a high rate of environmental contamination has been noted, as well as a lack of success in environmental conservation efforts and every day, Bangladesh creates roughly 25000 tons of waste in its cities (UNDP, 2018). Even amid the darkness, however, there are some reasons to be optimistic; this is particularly true in Bangladesh. A Swedish International Development Cooperation and UNDP project launched in 2018 to southernmost point called "Teknaf" sub-district to support the solid waste management (SWM) and succeeded to attain a 10% recycling from the waste

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products of households and markets. Another encouraging news is that the northern divisional city, Rajshahi had the distinction of having the lowest drop of air pollution in the world in 2016 (Graham-Harrison, & Doshi, 2016).

Importantly, it is better to start the zero-waste management program in urban homes with Rajshahi City Corporation since earlier achievements in environmental restoration and nurturing can be a big step forward for Bangladesh's zero-waste policy in the future. Furthermore, it is critical since developing countries lag behind industrialized economies in terms of recycling and domestic trash management. The developed world has a strong position in recycling, and people have a long history of doing so. Likewise, Germany, Austria, South Korea, Wales, and Switzerland are among the top five recycling countries in the world, with over 50% of municipal garbage recycled (Gray, 2017). In developing countries like Bangladesh, the rate is negligible, and there is little information available. There is huge study gap regarding the SWM and zero waste management system in the emerging third world countries, for-instance, in South Asia (Colona, Fawcettb 2006, p. 916) investigated in Indian megacities, and (Siddiqi et al. 2020, p.1) study in Karachi city Pakistan for metropolis waste material recycling.

The study's aim is to understand the household waste material management and recycling in Rajshahi City Corporation and how much the city dwellers has the capability of supporting a zero waste management in future.

### **Literature review / Research Background**

A timeline of the zero-waste movement has started earlier since 1970s while single-use plastics became commonplace and using reused materials like aluminum have the potential to save energy and money. Bea Johnson, a French American residing in California, is widely recognized with founding the zero-waste lifestyle movement by starting the practice to her small family with four members and documenting her journey on her blog Zero Waste Home (Zerowaste Blog, 2020). The concept of zero waste management is currently gaining momentum in business and circular economic aspects, such as economic cost, economic benefits, and incentives are three fundamental economic sectors of the zero-waste management concept, Zaman (2014). In addition, it has anticipated benefit by creating a circular economy that has a lower environmental impact and emits less CO<sub>2</sub>, less demand for costly, scarce resources and new employment sector in waste management, recovery, and reuse (European Commission Environment, Consumers & Health, 2021).

The goal of our literature analysis is to look at household waste management around the world to see what opportunities there are for further research in developing countries. (Abdullah, Salleh, Ismail 2017, p. 38) study focused on how households are well-informed about home solid waste management and how they feel about the services offered by a solid waste management concessionaire in one of Malaysia's areas, (Ayçin, Kaya 2021, p.1) intends to uncover potential impediments that have a significant influence in Turkey's zero waste management practices. There are studies on post consumption waste, and resource depletion, such as (Matete ,Trois 2008, p. 1480) tried to integrate a Zero Garbage techniques into an existing integrated



to answer a structural questionnaire regarding their households' waste material management. The questionnaire was prepared from prior literature review of high rank journals from Web of Science, Scopus, the Chartered Association of Business Schools (CABS) Journals and high-cited papers from Google Scholar.

In the random sampling process, researchers conducted the respective city wards councilor office and collected the holding numbers of households as a population list, chose ten sample from these list while research randomizer online application was used. The surveyed data set was coded in excel spreadsheet and analysed by descriptive statistics and logistic regression model typically for hypothesis testing. The core variables in the research concerned on socio-demographic features of households, economic conditions, environmental awareness, Perception of recycling and environmental sustainibility. There has been used logistic regression model to understand the relationships between dependent and independent variables, while Perception of recycling is regressed educational factors and environmental initiatives.

**Table 1: Logistic Regression models**

<p><b>Model 1:</b>  <math>Per\_recyclcy = \alpha_1 + \alpha_2 edu + \alpha_3 prev\_edu + \alpha_4 pres\_edu + ut</math></p>	<p><b>Model 2:</b>  <math>Per\_recycle = \beta_1 + \beta_2 ask\_separion + \beta_3 collection\_problem + \beta_4 incentive + vt</math></p>
<p><b>Per_recyclcy</b> = Perception of recycling  <b><math>\alpha_1</math></b>=intercept  <b>edu</b> =education attainment  <b>prev_edu</b>= previous education concerning environment  <b>pres_edu</b>= present education concerning environment  <b>ut</b>= error term</p>	<p><b>Per_recyclcy</b> = Perception of recycling  <b><math>\beta_1</math></b>=intercept  <b>ask_separion</b>= ask for separating household waste materials  <b>collection_problem</b>= city corporation collection major problem for recycling  <b>incentive</b>= incentives for recycling  <b>vt</b>= error term</p>

Source: Authors (2021)

## Results

**Descriptive Statistics on Socio-demographic features:** The key findings demonstrated that around 70% of the respondents are female as female members in a family more connected with the environmental issues as well as household chores and waste management of the household.

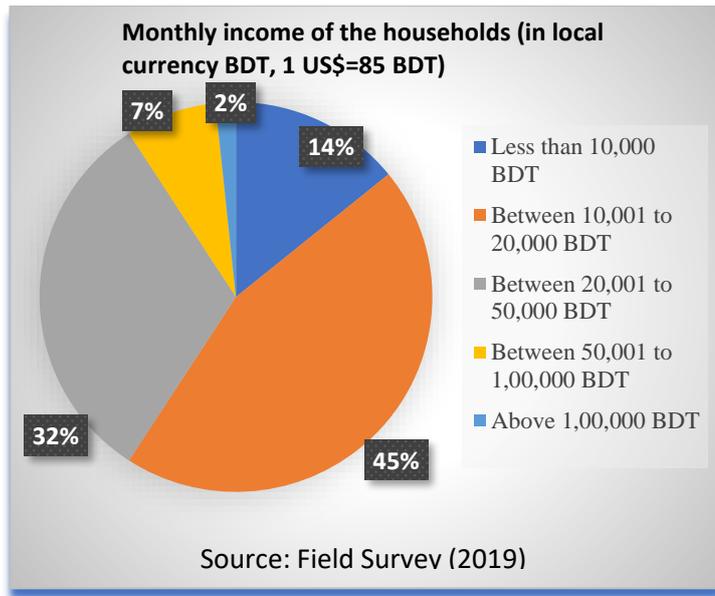
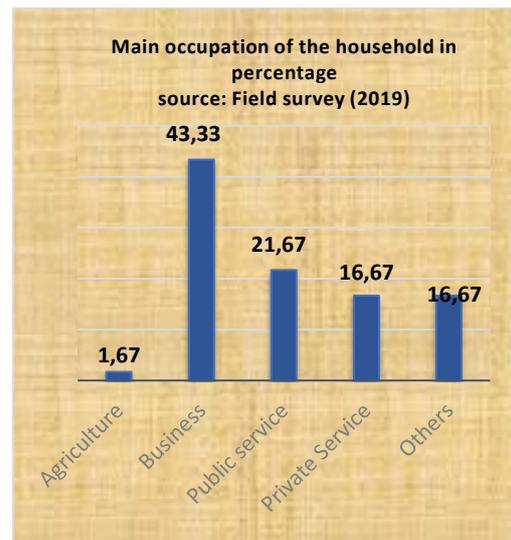
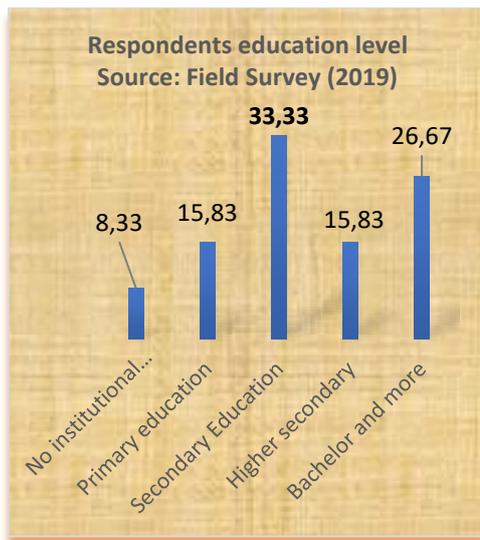


Figure 2: In the sample area, the average household income is between BDT 10,001 to 20,000. While the currency rate was in 06.06.2021, 1 US\$=85BDT. Figure 3 illustrates that around 33% respondents have secondary level education and 27% approximately have minimum bachelor degrees. Therefore, the education level is quite satisfactory in the study area. Figure 4 shows that majority of the people are either doing business or service holders under public or private sectors.

**Figure 2: The monthly income of households in local currency BDT.**



**Figure 3: Respondent education level**

**Figure 4: Main occupation of the households**

The data set also implies that the average household members are around five and approximately 61% members are between the age group (30-49 years). Therefore, it is the strength for our study to motivate the adult because they have better

experiences about environment and the practicalities. Another interesting result is that the average life span on living Rajshahi city is more than 20 years and that means households are living for a long time and have been adapted themselves with the environmental conditions of the Rajshahi Metropolitan Area.

**Household Waste Management Awareness:** 88% respondents had the HWM idea beforehand, and the major sources for receiving environmental related information is Television, friends and relatives, newspapers while internet sources have a little impact on it. Around 81% people received the idea from their previous level schooling (primary and high schools). The researchers asked why it is prominent to take care of the household garbage, they could only choose among the options, such as hazardous impact on human health (41.64 %), detrimental effect on environment (34.17%), the wastes look ugly and smells irritating (22.5%), and others (1.67 %). As majority of the household responded that environmental preservation is crucial for health purpose, the researcher asked the health condition by emphasizing on suffering any diseases of a family members during the last six weeks, the result shows that 59% households did not suffer by any of the diseases while others either have one or two of the following health issues, such as 18% have cough and breathing problems, 10 %, fever, 10% diarrhea as well, 4% skin problem. All these diseases any how related to the environment of the households, therefore, they were concerned about the health issues more than other options.

**Waste Management by Rajshahi City Corporation and Households:** Most of the families 98% put the waste materials in a bucket and 2 % keep public bin or plastic bags. 96% household empty the bucket once in a day and other 4% empty the garbage once in two days. Out of 120 respondents, 118 replied a positive feedback of city corporation household waste collection system and they put the waste to the city corporation waste collection vehicle, which is collected once in a day. Around 84% households have come to know about the recycling process beforehand. And 88 % agreed to separate their daily household products for recycling. Only 3 % households expect incentives to start recycling work and 54% concurred to see a moderately vibe of local ambience compared to the past five years

**Table 2. Households' initiatives for HWM and environmental success.**

<b>The initiatives undertaken by households</b>				
Level of cooperation	Agreed and asked local government to take initiatives on it.	Agreed but yet not asked.	Agreed but not do any cooperation.	Think it is impossible to have recycling
Percentage	14 %	60%	22%	4%
<b>How much households gained environmentally in last five years?</b>				
Too much improvement	Moderate improvement	As identical	Little unfavorable	Extremely bad
34 %	54%	9%	3%	0%

Source: Authors (2021)

**Empirical Findings:** The logistic regression is classified in two models, the first model while Perception of recycling is regressed by educational factors, such as present educational status of the respondent, previous education concerning environment and present education concerning environment. Overall, education has a positive impact on the Perception of recycling. While the education is significant at 5% with a stronger coefficient. On the other hand, the second model has been regressed with having identical dependent variable but environmental initiatives are regressors. The household is expected to accept the sorting of household waste materials for the purpose of recycling. The coefficient is 2.237170 and significant at 1% level. There is a great chance that the recycling project will be effective among the households if the initiatives are taken through proper channel. As the households believe the collection of sorted materials by the Rajshahi City Corporation is not a problem, so that whether collection is a problem, is negatively related to the Perception of recycling but statistically insignificant.

**Table 3: Logistic Regression models**

Estimation results of regressed variable Perception of recycling			
Variables	Model 1	Variables	Model 2
Intercept ( $\alpha_1$ )	-0.506023 [-0.46]	Intercept( $\beta_1$ )	-0.687053 [-0.29]
edu ( $\alpha_2$ )	0.433841* [1.78]	ask_separation ( $\beta_2$ )	2.237107*** [3.57]
prev_edu ( $\alpha_3$ )	1.552732** [2.37]	collection_problem ( $\beta_3$ )	-0.219831 [-0.43]
pres_edu ( $\alpha_4$ )	0.074338 [0.17]	incentive( $\beta_4$ )	0.300236 [0.27]
R-square	0.1712	R-square	0.1236
Obs	120	Obs	120
Note: *, **, and *** are the significant level at 10%, 5% and 1%, respectively			
Source : Authors (2021), estimations from STATA-12			

## Discussion

Education and prior knowledge are effective factors in the research, Cole et al. (2014), it is urgent to switch the focus from recycling to reuse, and the priority of increasing educational activities will tend to change household behaviours on environmental preservation. The respondents from Rajshahi city corporation have well understanding on health consequences of waste related pollution. The respondents were asked with an open-ended question on the main reason for protecting the metropolitan's environment, the answer was very straightforward with majority comments on having a healthy environment to keep sound health which is crucial for the future betterment. Abdullah et al. (2017), has identical finding on the health consequence of waste management. The second core issue of our research was based on the initiatives undertaken by households reflecting the awareness. For instance, 56% households receive the available information and particularly 46%

have prior idea on sustainable development in the study. Babaei et al. (2015) and Abdullah et al. (2017) found improvement in citizens awareness to promote sustainable waste recycling program. It requires to develop effective public campaigns, affordable and practicable plans relevant to local administrative framework (Zaman & Lehman, 2011a; Zorras et al. 2015) and try to develop an interior behavioural culture in SWM and reach the zero waste in future (Zaman & Lehman, 2011b; 2015; Babaei et al. 2015). Sustainable waste management practices yet have to meet a critical mass of success, Zotos et al. (2009), lack of financial aid is a key barrier of SWM (Aycin & Kaya, 2021), particularly the proposition of zero waste management is not a well-suited issue in developing countries, like Bangladesh, India and Pakistan where recycling has yet not started with a mass success. Motivation as well as promises can play vital role there, (Colon & Fawcett, 2006; Babaei, et al. 2015).

## Conclusion

The responsible behaviour by the households raises potential scope of recycling and zero waste management in Bangladesh. A push environmental development strategy by legal authority can be expected to reach the goals of sustainable environment. Importantly, education plays a crucial role in acquiring the basics of recycling and households waste management. The Rajshahi city corporation has a few successes in environmental conservation, but the government and local NGOs must fight for the formation of a household culture of minimal waste pollution and expected to turn into a zero-waste management system.

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## CHOOSING THE TARGET AUDIENCE FOR THE SALE OF ELECTRIC CARS IN RUSSIA

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### Abstract:

**Purpose:** The prospects for the Russian electric vehicle market substantially depend on the awareness of representatives of the younger generation, those who will choose their own cars in the near future, about the advantages of these vehicles. The main aim of this research is to explore the possible links between the factors that determine the process of choosing an electric vehicle and the intention to purchase it.

**Design/methodology/approach:** The source of the data was the results of a survey of young people aged 17–30 who are potential consumers of electric vehicles. For determining design features of respondents who intend to purchase an electric vehicle, the multiple correspondence analysis was applied. The results of the multiple correspondence analysis correlate with those from the paired association analysis and the ordinal regression estimation, which makes research conclusions more confident.

**Findings:** Males aged 21–24 who own cars and decide either independently or taking their mothers advise to purchase a car for the family are most likely to purchase an electric vehicle. Females aged 17–20 who own cars and whose decision was influenced by their fathers are the least likely to purchase an electric vehicle. In Russia, the general public is not aware of those technological advances that have allowed car manufacturers to significantly improve the consumer properties of electric vehicles. All other things being equal (car class and price), choosing an electric car is still unlikely. Consumer prejudice is prevalent about unfavourable weather conditions, which allegedly impede the operation of electric vehicles.

**Research limitations:** It should be noted that the study was of a pilot nature. To obtain more reliable and accurate conclusions and build a high-quality model suitable for practical use (for example, in targeted marketing), it is necessary to increase the number of observations by at least 2.5–3 times.

**Practical implications:** Expanding the presence of electric vehicles in car-sharing companies would significantly improve the experience of using electric vehicles for young users seeking high mobility who have not yet purchased their own car. It would help to promote electric vehicles on social media where users can share their experiences.

**Social implications:** The socio-demographic characteristics of consumers are weak in explaining their purchasing intentions. Those who are concerned about sustainability issues are interested in buying. In Russia the streets in the historical centre of the cities are too narrow, this poses a threat not only to air pollution, but also to the health of residents.

**Key words:** consumer behaviour, electric cars, electric vehicles, sustainability

### Introduction

Rapid development of the electric vehicles industry in the world is an obvious fact that cannot go unnoticed and attracts researchers' attention: over the past few years, sales and investments in this type of vehicle have demonstrated exponential

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growth. According to consulting agencies, this type of transport may displace conventional internal-combustion engine automobiles as the technology of electric vehicles advances and their prices get lower as well as the cost of owning them. In 2019, the global sales volume approached 2.2 million units, according to the Wood Mackenzie Agency. World leaders of the automobile industry bring new models of electric vehicles to the market annually. It is expected that by 2025, the share of electric transport will be 15–25% of the total number of automobiles.

Issues of mass, or even noticeable penetration of electric vehicles into the Russian market remain controversial (due to underdeveloped infrastructure, severe weather conditions, etc.). According to the AUTOSTAT Analytical Agency, there were 6,300 electric vehicles in Russia, as of January 1, 2020, which is only 0.014% of the total fleet of passenger cars in the Russian Federation.

To reduce prices for electric vehicles significantly, the Eurasian Economic Union (EAEU), which includes Russia, Armenia, Belarus, Kazakhstan and Kyrgyzstan has declared cancelling customs duties on imported electric vehicles. That decision applies to new and used electric vehicles and has come into force in May 2020.

Prospects for the Russian electric vehicles market depend substantially on the awareness of representatives of the younger generation, those to choose their own automobiles in the near future, of the advantages of these vehicles. This paper presents the results of study of prospects for electric vehicles use in Russian, during which the following tasks were solved:

- factors that determine ultimately the interest of young Russian consumers in electric vehicles identified;
- model to predict demand for electric vehicles constructed;
- target segment of electric vehicle consumers in Russia described.

## Literature review

The problem of energy conservation and environmental protection is becoming increasingly relevant in the world (Bozhuk et al. 2019a; Bozhuk et al. 2019b). Electric cars (vehicles) are one of the concepts of green and sustainable transport systems. The digital economy is developing and consumer behavior is changing (Krasnostavskaja et al. 2020a; Krasnostavskaja et al. 2020b). The limitation of the electric battery and the resulting restrictions on driver mobility are a serious consumer problem that car manufacturers must address. This becomes especially clear on long journeys when it is necessary to charge an electric car.

The main aim of this paper is to examine the potential links between factors that determine the process of choosing an electric vehicle and the intention to purchase it. In this section, we will review research themes: characteristics of the electric vehicle itself, the experience of driving cars and electric vehicles, environmental awareness and incentives, innovative value, personal characteristics and beliefs of the consumer, environmental factors shaping normative beliefs.

There is no consensus in the literature on the socio-demographic characteristics of the target audience of electric car buyers, but there is a study that, in terms of age, young people (under 45) are more likely to buy electric cars (Higueras-Castillo et al.

2020). The authors of the study selected people 17-30 years old as the objects of research, taking into account the results of the analysis of literary sources, as well as the current state of development of the automotive industry in the country. It is assumed that these potential consumers will be able to pay at the moment of widespread adoption of electric vehicles in 10-15 years.

An analysis of the demand research on the electric vehicle market was the basis for the development of Table 1, which addresses aspects of the purchase of an electric vehicle.

**Table 1. Review of research papers on aspects of buying electric vehicles**

Considered aspect of the purchase	Research essence	Research paper authors
Characteristics of the electric vehicle itself	Travel distance, speed, purchase price, safety, fuel economy influence the choice	Ciarapica et al. 2013; Dudenhöffer 2013; Bühne et al. 2015; Franke et al. 2016; Thananusak et al. 2017; Karlsson 2017; Knez, Obrecht 2017; Darup, Guillen, Piulachs 2018
The experience of driving cars and electric vehicles	The average values of subjective norms, perceived behavioural control, attitudes and readiness to accept in experienced consumers are significantly higher than in inexperienced consumers	Miao et al. 2014; Muraya, Capehart 2015; Mangmeechai, Yuan 2018; Darup et al. 2018; Ling et al. 2019; Hinnüber, Szarucki, Szopik-Depczyńska 2019; Liu et al. 2020
Environmental awareness and incentives	The choice is determined by environmental awareness, the idea of reasonable consumption	Larson et al. 2015; Darup et al. 2018; Mangmeechai, Yuan 2018; Fyhri, Beate Sundfør 2020; Jin, Yao, An 2020
Innovative value	Innovative consumers are particularly sensitive to the innovative aesthetic value of an electric vehicle	Sierzchula et al. 2012; Naor et al. 2015; Schmidt et al. 2016; Proff, Fojcik 2016; Rossini et al. 2016; Zhgulev et al. 2018; Nagel, Schumann 2020
Personal characteristics and beliefs of the consumer	Gender, age, vehicle ownership in family influence	Ling et al. 2015; Bennett, Kottasz, Shaw 2016; Darup et al. 2018; Ning et al. 2019
Environmental factors shaping normative beliefs (Subjective Norm)	Consideration should be given to the influence of government policies, media, social media	Dini, Washington, Hawkins 2013; Lim, Chen, Yap 2014; Malik, Prakash, Kapoor 2018; Sharida, Al-Hashimi, Hamdan 2020

Source: developed by the authors of the research.

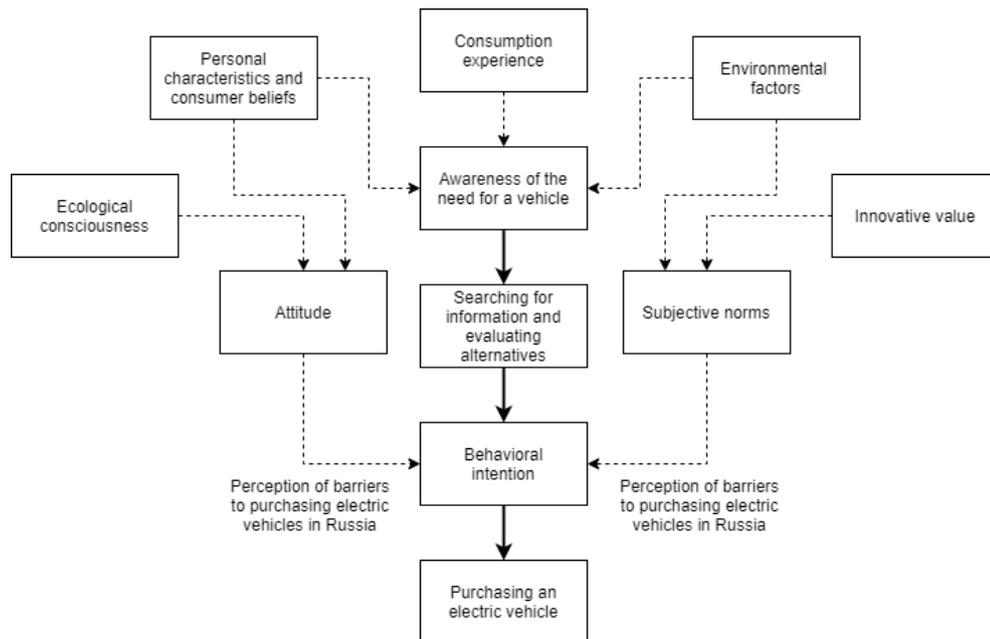
## Methodology

Articles from 2012-2020 were selected for the development of Table 1. The selection criterion for articles was the belonging of articles to economic and marketing topics, the state and trends of the electric vehicle market, the presence of a study of factors affecting the purchase of electric vehicles.

Results of the survey of young people aged 17–30, who are potential consumers of this type of transport, became the data source. There is a significant age asymmetry in the sample, i.e., young respondents (79.2% of all respondents are

18– 21 years old) dominate over those whose age is approaching 30. The initial data set contained questionnaire data submitted by 381 respondents. After “cleaning” the data, i.e., deleting questionnaires with omissions (more than 50 % of blank fields), the number of observations decreased to 371. The study included features that may be divided into feature-factors (9) and resulting attributes (12).

Factors included characteristics describing the respondent (including those of car user): age, gender, availability of a car in the family, person who influenced the choice of the car, frequency of car use, distance of trips. The analysis of research papers became the basis for the development of a model of factors that determine the process of choosing an electric vehicle and the intention to purchase it. This model is presented in Figure 1.



**Figure 1. Factors determining the process of choosing an electric vehicle and the intention to purchase it**

Source: developed by the authors of the research.

Data were analysed with SPSS computer application for statistical data processing. For determining design features of respondents who intend to purchase an electric vehicle, the multiple correspondence analysis was applied. The choice of this method is determined by the fact that most of the features are non-quantitative. The result of applying the multiple correspondence analysis is a representation of the original dependent variables in the lower-dimensional space (usually two-dimensional). Survey method: quantitative survey using the Internet. The study was conducted from 15.01.2021 to 15.02.2021.

## Results and Discussion

The females are on average less likely than males to purchase an electric vehicle (at the significance level of 3%). Those who frequently use cars with internal-combustion engine are less likely to purchase an electric vehicle than those who rarely use cars (at the significance level of 7%). Those who consider “environmental protection” or “health care” to be the reason for widespread use of electric vehicles in Europe, are more likely to purchase an electric vehicle than those for whom the said reason is “fashionable trend” (at the significance level of 0%). People at the age of 21 to 24 are most likely to purchase one (12% significance).

Generalizing the results on the paired relations, we may conclude that males develop a stronger intention to purchase an electric vehicle with age.

Based on the data in the multiple responses Table 2, coordinates for 28 values categories of 9 features in two new dimensions (integral variables) were determined.

**Table 2. Multiple responses based on “explicit” factors**

Feature	Category	Probability of purchasing an electric vehicle		
		unlikely	unsure	most likely
Gender	Female	63	81	83
	Male	25	41	78
Age	17–20	77	96	106
	21–24	8	15	36
	25–30	3	11	19
Availability of an automobile	Yes	65	85	119
	No	23	37	42
Person who influenced the choice of the car in the family	Father	41	66	63
	Mother	12	7	21
	Self	8	4	22
	Other	4	8	13
Frequency of use	Frequently	57	63	91
	Moderately	6	18	17
	Rarely	2	4	11
Trip distance	Long	28	46	67
	Average	28	19	34
	Short	9	20	18
Feasibility of having two automobiles in the family	Unfeasible	24	40	59
	Feasible	28	33	46
	Comfortable	36	49	56
Automobile is a strong source of pollution	No, absolutely not	1	3	8
	No	5	13	17
	I don't know	15	25	21
	Yes	54	53	70
	Yes, absolutely	13	28	45

Source: developed by the authors of the research.

People aged 21-30 were selected because, in the total number of their age groups, these people had a higher percentage of the choice of the answer “most likely”: 59.78% (55 respondents out of 92 respondents) versus 38.00% (106 respondents out of 279 respondents).

Summarizing results of the comprehensive statistical data analysis, we can offer the following profile of a potential Russian consumer of electric vehicles. Typical features values of that consumer are presented in Table 3.

**Table 3. Characteristics of the potential Russian consumer of electric vehicles**

Consumer characteristic (feature value)	Typical value
Gender	Male
Age	21–30 (years old)
Car availability	Yes
Person who influenced the choice of the car	Himself or his mother
He believes that the cause for the widespread use of electric vehicles in Europe are	Health care, environmental protection
He believes that the key problem of using electric vehicles in Russia is	Poor awareness of offer in electric vehicles
His opinion with regard to the Russians' interest in electric vehicles	They are interested

Source: developed by the authors of the research.

Males aged 21–24 who own cars and decide either independently or taking their mothers' advise to purchase a car for the family are most likely to purchase an electric vehicle. Females aged 17–20, who own cars and whose decision was influenced by their fathers, are the least likely to purchase an electric vehicle. It should be noted that the results of the multiple correspondence analysis correlate with those from the paired association analysis and the ordinal regression estimation, which makes our conclusions more confident. In Russia, electric vehicles are still considered an innovative product, and awareness of it remains poor.

## Conclusion

It should be noted that the study was pilot in nature. To obtain more reliable and accurate conclusions and build a high-quality model suitable for practical use (for example, in target marketing), it is required to increase the number of observations by a factor of 2.5–3, at least. Also, respondents over 30 years old should be added to the study. All other things being equal (vehicle class and price), the choice in favour of electric vehicle still faces a poor chance. Consumer prejudices with respect of adverse weather conditions that hamper operating electric cars allegedly, prevail. Expanding representation of electric vehicles in carsharing companies would improve significantly the experience in using electric vehicles by young users striving for high mobility, who have not purchased their own car yet.

Promoting electric vehicles in social networks, where users can share their experience would help too. Consumers' socio-demographic characteristics are weak in explaining their purchasing intentions. From the point of view of predicting consumer behaviour, features describing consumers' value orientation have demonstrated stronger influence.

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## NON-FINANCIAL REPORTING OF LARGE UNDERTAKINGS IN THE CZECH REPUBLIC

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**Abstract:** Directive 2014/95/EU was implemented in Czech accounting legislation with effect from 2017. It introduced an obligation for certain undertakings to report non-financial information. The paper deals with non-financial information and its reporting by large undertakings in the Czech Republic. It defines the theoretical basis of non-financial reporting and the degree of implementation of the Directive in Czech accounting legislation. The analytical part of the paper is based on the content analysis of annual reports or separate non-financial reports of the large undertakings, for which the reporting of non-financial information is mandatory, for the years 2016, 2017, and 2018 according to the GRI methodological procedure. On the basis of the comparison of annual reports in the years analysed, the impacts of the implementation of the Directive on the reporting of non-financial information and the approach of the undertakings concerned to its reporting are identified. Furthermore, the relationship between the size of the undertaking within the category of large undertakings with more than 500 employees and the reporting of non-financial information for 2018 is examined. In total, annual reports or specialized non-financial reports of 568 undertakings were studied.

**Purpose:** One of the aims of this paper is to answer the question of whether there has been a qualitative or quantitative change in the non-financial reporting of enterprises for which disclosure is mandatory. It also deals with the answer to the research question whether the size of a company in the category of large companies affects the willingness of companies to report non-financial information.

**Methodology:** A comparison of reported non-financial information was made for 2016 and subsequently for 2017 and 2018, i.e., for the years before and after the implementation of the Directive. On the basis of comparison, it was examined whether the legislative measure adopted contributed to higher quality non-financial reporting. The total number of undertakings is 15. The content analysis of a total of 45 reports for the years 2016, 2017 and 2018, which was performed manually, enabled to assess the approach of the undertakings studied to non-financial reporting. Subsequently, the data were processed using MS Excel. The research was based on indicators which included economic, environmental, labour law, human rights and social areas. Specific non-financial indicators were based on the Global Reporting Initiative (GRI) methodology.

**Findings:** It was found that more than half of the undertakings surveyed are not interested in full reporting of non-financial information and at the same time it was statistically proven that there is a significant relationship between willingness to report non-financial information and the size of the undertaking with respect to turnover, assets, and number of employees..

**Key words:** annual report, Directive 2014/95/EU, large undertaking, non-financial information

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## Introduction

At present, in addition to financial reporting of undertakings, non-financial reporting is also becoming increasingly important. Non-financial information is the information about the undertaking's activities, especially in social, environmental and ethical fields Pramanik et al. (2008). This interconnects these activities with the economic activity of the undertaking. Information about culture of the undertaking, care for employees and customers or the environment says a lot about the undertaking and its future development as significantly as, for example, information about the profitability of the undertaking and capital appreciation Nguyen et al. (2020). Therefore, the main mission of every undertaking should be to harmonize the economic meaning of business with the responsibility for its impacts on the whole society. What becomes evident is the need for transparent communication of this requirement, i.e., reporting to the public. Ioannou & Serafeim (2017) emphasize the need for transparency in the disclosure of the impact of corporate activities on society, which they clearly see as a commitment to society. Boutin-Dufresne & Savaria (2004) points out the growing importance of non-financial reporting, which they consider a very important report on sustainability. Jones (2014) describes the period from 2010 onwards as the "Age of Damage", calling for responsible disclosure of non-financial information in connection with financial information. On the other hand, in recent years, there has been a growing interest of users in disclosure of non-financial corporate information, as observed by Haller et al. (2017) and Lončar et al. (2019). Non-financial information contains a wide range of aspects and its impact can therefore be very broad. The fact that there is no uniform definition of the content of non-financial information leads to large differences in its reporting by individual undertakings. One of the most developed methodologies that defines non-financial indicators is the Global Reporting Initiative (GRI STANDARDS). On its basis, the indicators are divided into five main areas: economic, environmental, labour law, social, and human rights. These areas come from the triple bottom line for public sector accounting, which was approved by the UN in 2007 (Plášková & Ryšánek, 2016).

## Literature review

On 22 October 2014, Directive 2014/95/EU (hereinafter the Directive), which contains non-financial reporting of large undertakings, was adopted by the European Parliament and the Council. For the first time it imposes an obligation on certain large undertakings to report non-financial information. The information must be with a clearly defined structure either in the annual report or in a separate report. This Directive amended the former Directive (Directive 2013/34/EU), which recommended reporting non-financial key performance indicators of the undertaking together with financial indicators. However, the obligation to report this information is imposed only on large public-interest entities, as their activities have significant impacts on society as a whole. The European Union (EU) has long sought to reduce the administrative burden on small and medium-sized undertakings. For this reason,

these undertakings are excluded from the recommendations and are therefore not required, unlike defined large undertakings, to report non-financial information from 2017. The aim of the European Commission is to strive for a sustainable world economy that combines long-term profitability with social justice and environmental protection. (eur-lex.europa.eu). The Directive is the first instrument to lay down general rules and requirements for the reporting of non-financial information in order to make the reporting of this information uniform and systematic for undertakings within the EU. Some undertakings perceive non-financial reporting as unnecessary and inefficient, which follows from a study by (Sedláček & Popelková, 2020), who stated that some undertakings are not interested in publishing financial statements, even regardless of regulatory requirements and user needs. In contrast, some undertakings were found to have reported non-financial information even before the adoption of the Directive. These are undertakings that pride themselves on their know-how, popularity with customers, attitude to the environment, etc. According to Zdražilová (2010), economic responsibility is a possible competitive advantage for an undertaking. Weihrich (2013) see non-financial reporting as increasing the undertaking's credibility and transparency as well as building a reputation which leads to a strong market position.

In 2016, Act No. 462/2016 Coll. amending the original Act No. 563/1991 Coll. on Accounting, as amended, was published in the Collection of Laws in Volume 185. This is the measure by which the Directive was implemented in law. Therefore, from 2017, large undertakings in the Czech Republic must report non-financial information in a form defined by the Accounting Act if they are commercial undertakings and public interest entities at the same time and if at the balance sheet date, they exceed the average number of employees of 500.

In contrast to developed European countries, especially Western Europe, non-financial reporting does not have a long tradition in the Czech Republic. Non-financial reporting has a strong tradition especially in countries with strong capital influence where investment decisions depend on the information published in annual reports Nobes et al. (2012). Undertakings in the Czech Republic do not attach much importance to non-financial reporting, as shown by research Schwarzová (2019). However, Čevela & Bílková (2016) point out that in recent years there has been an increased interest in disclosure of non-financial information by undertakings in the Czech Republic. A similar topic was also addressed by KPMG (2017), which confirms that significant progress has been made in non-financial reporting in the Czech Republic. It can therefore be further assumed that in the coming years a larger number of undertakings will report non-financial information, and its quality will increase. At the same time, Sedláček (2020) draws attention to a growing trend towards publishing non-financial information by large undertakings in comparison with small and medium-sized undertakings.

## Methodology

One of the aims of this paper is to answer the question of whether there has been a qualitative or quantitative change in the non-financial reporting of enterprises for

which disclosure is mandatory. It also deals with the answer to the research question whether the size of a company in the category of large companies affects the willingness of companies to report non-financial information.

A comparison of reported non-financial information was made for 2016 and subsequently for 2017 and 2018, i.e., for the years before and after the implementation of the Directive. Based on comparison it was examined whether the legislative measure adopted contributed to higher quality non-financial reporting. The total number of undertakings is 15. The content analysis of a total of 45 reports for the years 2016, 2017 and 2018, which was performed manually, enabled to assess the approach of the undertakings studied to non-financial reporting. Subsequently, the data were processed using MS Excel. The research was based on indicators which included economic, environmental, labour law, human rights and social areas. Specific non-financial indicators were based on the Global Reporting Initiative (GRI) methodology.

## Results

### **Impacts of the implementation of the Directive on the quality and quantity of reported non-financial information**

In the Czech Republic starting from 2017, large accounting entities that are commercial undertakings and public interest entities at the same time are required to report non-financial information if at the balance sheet date, they exceed the criterion of an average number of 500 employees during the accounting period. After the exclusion of financial institutions, this obligation applies to a total of 15 undertakings, which must provide non-financial information. This section will examine whether there has been a qualitative or quantitative change in the reporting of non-financial information by these undertakings since 2017 when the Directive came into effect.

The table 1 shows the results of the analysis of non-financial information disclosed by all fifteen undertakings in the Czech Republic that have this obligation for 2016, 2017 and 2018. The results for 2017 and 2018 are identical, therefore they are given in one column. Each section of the table focuses on one area of non-financial reporting in accordance with the GRI methodology.

The first area is the economic area, which most often includes information about investments and risks. The second most reported indicator is the representation of the state as the owner in the ownership structure. Another reported subject is the environmental area, with the most frequently reported information being total consumption (and possibly sales) of electrical energy or e.g. use of renewable materials in production/operation. The companies do not report at all on potential negative impacts that their business might have on the environment and on the rate of reduction of these impacts. The third area of non-financial reporting is the area of labour law. Most companies report a percentage of persons in governing bodies by sex. This is followed by information on the type and scope of training provided to employees to improve their skills.

A part of non-financial reporting about the undertaking is also the social area. The undertakings studied here mostly dealt with legal acts of unfair competition.

It should be noted that the implementation of the Directive did not in principle bring about a quantitative or qualitative improvement in reported non-financial indicators, as it follows from the analysis. Only minimal differences were found in the individual areas of non-financial reporting. This situation can be attributed to the fact that even the statutory audit of these undertakings in the field of non-financial information does not order a closer examination of its content, it only requires an auditor's opinion on whether the non-financial information was presented and disclosed. For detailed results and numbers see attached Table 1 below, where there are only criteria that were reported by at least 5 surveyed enterprises in the monitored years. The social area is missing in the table, because in no year at least 5 monitored companies did not show the criteria.

**Table 1: Non-financial reporting in the economic, environmental, social area and in the area of labour law**

Indicator	Number of reporting undertakings	
	2016	2017, 2018
<b>Economic area</b>		
Total value received by the undertaking from the state or state organizations (including e. g. tax reliefs and benefits, incentives, contributions, grants, etc.)	6	6
Information on whether and to what extent the state is represented as the owner in the ownership structure of the undertaking	7	7
Rate and development of significant investments in infrastructure projects and related services	9	10
<b>Environmental area</b>		
Use of non-renewable materials in production / operation	4	5
Use of renewable materials in production / operation	5	5
Total consumption of fuel from non-renewable resources by type of fuel	4	5
Total consumption of electrical energy	5	6
Reduction of energy consumption as a direct impact of energy-saving investigations and initiatives	5	6
<b>Labour law</b>		
Information about the type and scope of training provided to employees	0	7
Percentage of persons in governing bodies by sex	9	9

Percentage of persons in governing bodies by age groups	5	5
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Source: The author's own work based on annual or separate reports of the undertaking.

The following criteria were reported by less than 5 companies, therefore they are not included in the table above and are mentioned in the text instead. The average count of companies that reported on the following criteria ranged from 1 to 3. The criteria from the **economic area** are Description of risks and opportunities associated with climate change and their classification, Possible impacts of risks and opportunities that would occur if no remedial action was taken, Costs of measures taken in response to these risks/opportunities, Proportion of employees on the minimum wage to all employees, Actual or expected positive or negative impact of these investments on local communities and the economy, Economic development in economically backward areas, Increasing skills and education in a professional group or geographical region, Supporting, enabling or limiting foreign direct investment and Information on whether these investments and services are of a commercial nature or whether they are voluntary or pro bono activities. *The change in reporting between 2016 and 2017 occurred only for the criteria:* Costs of measures taken in response to these risks/opportunities, Actual or expected positive or negative impact of these investments on local communities and the economy, Increasing skills and education in a professional group or geographical region, Information on whether these investments and services are of a commercial nature or whether they are voluntary or pro bono activities and in all cases, the change was by one company.

From the **environmental** area the criteria are Recycled input materials used for the production of primary products and services, Total consumption of fuel from renewable resources by type of fuel, Total consumption of energy for cooling and air conditioning, Type of energy whose consumption was reduced, Reduction of energy intensity of products and services for the period studied, Total volume of water consumed from various sources, Total volume of water recycled and reused by the undertaking, Significant direct and indirect impacts of the undertaking on biodiversity, Size and location of all protected or restored environments, Information on whether there is a partnership with third parties concerning the protection or restoration of the environment, Direct and indirect greenhouse gas emissions, Information about which greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, etc.) were emitted, Total number of significant non-monetary sanctions and the monetary value of penalties, Negative environmental impacts of the transport of products and other goods and material and the transport of employees, Total expenditure on waste disposal, emissions management and remediation measures. *The change in reporting between 2016 and 2017 occurred only for the following criteria:* Recycled input materials used for the production of primary products and services, Total consumption of energy for cooling and air conditioning, Type of energy whose consumption was reduced, Reduction of energy intensity of products and services for the period studied, Significant direct and indirect impacts of the undertaking on biodiversity, Size and location of all protected or restored environments, Negative environmental

impacts of the transport of products and other goods and material and the transport of employees and always just by one company.

Regarding **labour law area**, the criteria are Total number and proportion of newly hired employees by age and sex, Benefits provided as standard to full-time employees that are not provided to part-time employees or employees on other types of contracts, Type of workplace accidents, percentage of accidents, proportion of occupational diseases, missed days and fatal work-related accidents, Average number of training hours that employees participated in, Percentage of persons as employees by sex. *A change by one company occurred in reporting of criterion* Average number of training hours that employees participated in.

From the **social area** the criteria are Undertakings with significant actual or potential negative impact on local communities, Training of and communication of valid anti-corruption policies to employees, Total number and nature of confirmed cases of corrupt practices, Lawsuits against the undertaking or its employees on suspicion of corrupt practices, Number of legal acts in the field of unfair competition, cartel agreements and monopolistic practices, Main results of completed legal acts in this area, Information on infringements that led to the imposition of fines and sanctions, Number of complaints concerning the influence on the undertaking filed through formal channels during the accounting period. *A change by two companies occurred in reporting of the following criteria:* Training of and communication of valid anti-corruption policies to managing authorities, Total number and nature of confirmed cases of corrupt practices, Lawsuits against the undertaking or its employees on suspicion of corrupt practices, Significant fines and non-monetary sanctions. *A change by one company occurred in reporting of the following criteria:* Undertakings with significant actual or potential negative impact on local communities, Lawsuits against the undertaking or its employees on suspicion of corrupt practices, Number of legal acts in the field of unfair competition, cartel agreements and monopolistic practices, Main results of completed legal acts in this area, Information on infringements that led to the imposition of fines and sanctions.

### **Non-financial reporting with respect to the size of the undertaking**

This part of the paper gives us an answer to the basic research question whether the size of the undertaking within the category of large undertakings affects the willingness of undertakings to report non-financial information. The size of the undertaking is determined by the size of turnover. A study was made of undertakings which are classified as large accounting entities and at the same time have more than 500 employees. The undertakings meeting these criteria were obtained from the Orbis database for 2018. A total of 568 undertakings were examined. Finally, a hypothesis was formulated to find an answer to the basic research question.

A prerequisite for the use of the Pearson chi-square test is that at least 80 % of the expected frequencies acquire values higher than 5. For this reason, pivot table was first compiled. Furthermore, the dependencies between selected quantities on the basis of the statistical test of chi-square independence will be tested. In the

following pivot table, the size of the undertaking is determined by the size of turnover both in absolute and relative terms.

H<sub>10</sub>: There is no relationship between the non-financial reporting of the undertaking and the size of its turnover.

The table below examines the relationship between these quantities.

**Table 2: Relationship between non-financial reporting (NFR) and the size of the undertaking with regard to its turnover in millions of EUR.**

Turnover in millions of EUR	NO		YES		Total	
	Absolute	%	Absolute	%	Absolute	%
< 100	170	73	62	27	232	100
100 - 200	93	60	61	40	154	100
200 - 300	34	50	34	50	68	100
300 - 400	14	44	18	56	32	100
400 - 600	10	36	18	64	28	100
600 <	5	9	49	91	54	100
<b>TOTAL</b>	<b>326</b>	<b>57</b>	<b>242</b>	<b>43</b>	<b>568</b>	<b>100</b>

Source: The author's own work.

The table 3 shows the result based on statistical testing using the Pearson chi-square test to determine the relationship between NFR and the size of the undertaking with respect to its turnover.

**Table 3: Results of statistical testing**

Undertaking size by	Degrees of freedom	p-critical	p-statistic	p-value
Size of turnover	5	11.1	328.99	5.22155E-14

Source: The author's own work.

With regard to the answer to the basic research question, the hypothesis was evaluated, namely there is no relationship between the willingness to report non-financial information and the size of the undertaking with regard to the size of turnover. The testing resulted in the rejection of the null hypothesis that there is no relationship between non-financial reporting and the size of the undertaking. It can therefore be confirmed that there is a significant relationship between the willingness to report non-financial information with regard to its size. Empirical data confirmed the reluctance of the remaining undertakings studied to report this information.

## Conclusion

The paper examined the issue of disclosure of non-financial information in relation to its quantity and quality. The first part of the paper dealt with undertakings that are public interest entities and non-financial reporting is mandatory for them. The study was based on content analysis of annual reports of Czech public interest entities or separate reports on non-financial information in 2016, 2017 and 2018 and their subsequent comparison. The original assumption that there was a qualitative and quantitative increase in reported indicators, especially in 2017, i.e., after the implementation of the Directive, was not confirmed. With regard to the quality and quantity of reported information, there was only a minimal difference between individual years. This can be attributed to the fact that the Directive defines the requirements for non-financial reporting rather generally without further specifications. Despite the obligation to report non-financial information, the method and form of reporting are not specified. The consequence is that even undertakings, for which non-financial reporting is mandatory, report in different quantities and qualities. However, the analysis showed that in most cases non-financial reporting serves primarily as a tool for presenting successes and positive activities of the undertaking.

The second part of the paper examined undertakings that are classified as large accounting entities and also have more than 500 employees. A total of 568 undertakings were examined, and it was found that only 43% of them report non-financial information. In this part of the paper, the aim was to answer the research question whether the size of turnover of the undertaking within the category of large undertakings affects the willingness to report non-financial information.

The results show that it would be appropriate to create rules for reporting non-financial information, in particular with regard to its structure and content. It is suggested to prepare reports according to the GRI instructions and framework. This would lead to higher quality reporting of non-financial information and increased transparency and competitiveness of Czech undertakings and convergence with other developed countries.

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# PATTERNS OF SUSTAINABLE CONSUMPTION IN HIGH CONSUMPTION SOCIETIES. CASE OF POLAND

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**Abstract:** The aim of this paper is to identify the patterns of sustainable consumption and the barriers that emerge during their implementation.

**Methodology:** The assumed aim was executed thanks to the application of the method of critical analysis of both national and international literary sources associated with sustainable consumption, while also the analysis of the findings of empirical research in the scope of occurrence of the patterns of sustainable consumption.

**Findings:** The findings of the empirical research indicate the relatively widespread application of the patterns of consumer behaviour that are characteristic of sustainable consumption on the part of consumers in Poland. Their dispersal is certified to by the increase in behavioural traits such as: the segregation of waste, the use of multi-use bags, partial restraint from driving cars, avoidance of the purchase of products that are harmful to the environment and the increase in the consumption of vegetables in the household. Barriers to its development would include the increasing use of utilities (electricity, water) in households, while also the increase in the indicator of motoring and the rising air pollution.

**Research limitations:** The research findings acquired, with regard to their varied nature (survey research, quantitative research) constitute the basis for limited conclusions.

**Practical implications:** The research findings provide knowledge on the magnitude of sustainable consumption and its barriers to development, which may serve the purpose of preparing new solutions in the policies of sustainable development.

**Social implications:** The research findings illustrated in this paper indicate changes in the attitudes of consumers with regard to the choice of products and the forms of consumption that are characteristic of sustainable consumption.

**Key words:** consumer behaviour, ecological consumption, sustainable consumption, sustainable development

**JEL:** E21, Q59

## Introduction

In discussions about sustainable development, there are aspects related to alternative methods of consumption vs. the excessive consumption characteristic of a consumer society. One of them is sustainable consumption, which creates attitudes of consumer co-responsibility for the social and environmental effects of excessive consumption. The key idea of sustainable consumption is the pursuit of moderation in the purchase of new goods and consumption of products that do not damage the natural environment and the implementation of the goals of sustainable development, i.e. the principle of intra-generational and intergenerational justice.

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Sustainable consumption is one of the primary goals of sustainable development. It is often treated both as the core of sustainable development and a cross-cutting issue that is embedded in other goals of this development. In the context of sustainable development, the discussion on the need to change consumption towards consumption responsible for the natural and social environment is developing, which prompts the search for consumption patterns that could be promoted as important for the future.

The main goal of the article was to search for answers to research questions: What patterns of sustainable consumption occur in Poland? What are the barriers when it comes to their implementation? The assumed goal was achieved thanks to the use of the critical analysis method of the results of empirical research regarding sustainable consumption.

### **Literature review- Sustainable consumption**

Sustainable consumption is an essential part of sustainable development. Its idea was developed in Agenda 21 documents (the proposed solutions covered promoting eco-efficiency and using market instruments to change consumption patterns), adopted by 179 countries during the Rio Earth Summit in 1992 (United Nations Conference on Environment and Development 1992). Sustainable consumption was first defined in the United National Environment Program (UNEP) as "the use of services and related products which respond to basic needs and bring a better quality of life, while minimizing the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations" (Liu et al 2017, p.1). At the same time, there is no agreement when it comes to a precise definition of sustainable consumption, or even in terms of the scope of application of this concept. Researchers have different opinions in relation to sustainable consumption. The first group of researchers perceives it in a narrower context, i.e. consumer behaviour and lifestyle. For example, Seyfang (2009, p.3) defines sustainable consumption as "the consumption of more efficiently produced goods, and the 'green' and 'ethical' consumer is the driving force of market transformation, incorporating both social and environmental concerns when making purchasing decisions". The second group of researchers focuses on the broader context, concentrating on production processes and consumer goods, suggesting that the path to sustainable consumption leads mainly through more efficient, environmentally-friendly production and more sustainable products (Jackson 2007). The third group focuses on the impact of sustainable consumption on future generations. For example, the Oxford Commission on Sustainable Consumption (2000) defines sustainable consumption in terms of the ability of present and future generations to meet their tangible and intangible needs without causing irreversible damage to the environment or loss of function in natural systems. The fourth approach assumes that the most important

goal should be ecological consumption. The key to its implementation is the growth of rational and ecologically-aware attitudes and behaviours based on deep values (Ottman 2003).

Various research perspectives can be found in the analyses of sustainable consumption. Some researchers focus on identifying factors influencing sustainable consumption, e.g. the impact of individual consumer behaviour on the quality of the natural environment (Liu et al., 2017; Wang et al., 2014). Some researchers perceive sustainable consumption as a form of anti-consumption (Black 2010), while others identify its practices with a “green” lifestyle (Gilg et al., 2005).

Due to the multi-dimensional aspect of this concept, sustainable consumption does not have unambiguously formulated indicators for its research. One of the proposed indicators for identifying the size of sustainable consumption is the set of indicators of sustainable consumption by Seyfang, (2009, p. 62), who listed localisation, reducing ecological footprints, community-building, collective action and building new infrastructures of provision. The purpose of localisation is supporting local businesses; eating more local, seasonal food to cut food miles; encouraging money to circulate locally; ‘buy-local’ campaigns; DIY, growing food on allotments. Reducing the environmental footprint of consumption can be achieved through shifting consumption to cut its social and environmental impact on others, to reduce the inequity of current consumption patterns; cutting resource use; demand-reduction; carbon-reduction and low-carbon lifestyles. A local community can be built through the development of social networks around green building, local food, social volunteering; overcoming social exclusion barriers that make participation more difficult. Collective action can be developed by encouraging participation in local organizations; involvement in local government and public policy; generating critical mass to make new sustainable behaviours become the standard. New infrastructures of provision can be built through creating alternative food systems which avoid supermarkets; autonomous housing which doesn’t rely on mains services; new systems of exchange.

Among the indicators described above, the ecological footprint of consumption deserves more attention, due to its importance in discussions on sustainable development. The purpose of the ecological footprint research is to compare actual consumption of renewable resources and services by people, and nature’s supply of renewable such resources and services (Rees, Wackernagel 1996). Therefore, the ability of the Earth to regenerate, i.e. to restore the biological capacity of the environment (bio-capacity), is important. Bio-capacity acts as an ecological benchmark against which we can assess humanity's demand for natural resources for the biologically productive surface required to supply these resources and absorb waste (Galli et al., 2014). The value of the ecological footprint of consumption determines the area of biologically-productive area that is necessary to meet the vital needs of the human population, taking into account the lifestyle. The above makes it possible to determine whether the activities related to consumption are within the

biological threshold defined by the biological capacity of the Earth (Lin et al., 2015). Thus, the ecological footprint as an indicator of sustainable consumption allows the assessment of the human pressure on the environment through the consumption of goods and services.

The implementation of the concept of sustainable consumption requires determination and many changes, which relate to such aspects as, determining the proportion between current and future consumption, optimizing satisfaction with consumption while maintaining an appropriate level of quality and usability of natural resources and the natural environment, fairly evenly distributed consumption among all people, establishing the right proportion between material consumption and meeting intangible needs.

## **Methodology**

The research of sustainable consumption patterns in Poland consisted in the use of secondary analysis of existing quantitative data (desk research), which was used to investigate data contained in Eurostat reports, research institutions, author's own studies, and articles in scientific journals. As a result of the conducted research, some conclusions were drawn concerning the perspectives of sustainable consumption in Poland.

## **Results**

One of the strategic goals of the implementation of sustainable development is to reduce waste by promoting appropriate consumption patterns and developing environmental awareness of the society. An important model of sustainable consumption is the reduction of municipal waste. The indicator of municipal waste generated per capita allows to monitor the negative impact of waste on the natural environment. Table 1 evidences that the amount of municipal waste generated per capita in Poland is relatively low compared to the EU average. The most waste per capita was generated by Denmark, Luxembourg, Cyprus and Germany. The least by Romania, Estonia, Poland and Slovakia. It can be concluded that the level of welfare affects the amount of waste. In high-income countries, the amount of waste is much higher than in low-income countries (Eurostat 2020).

Another pattern of sustainable consumption related to municipal waste is the segregation of household post-consumer waste. Research shows that 95% of Poles declare that their household rubbish is segregated (CBOS 2020). Similar results were also obtained in the author's research. Waste segregation (separation of glass, plastic, paper from the rest) is declared by 93% of Poles (Bylok 2018).

**Table 1 Municipal waste generated in households per capita (kg)**

Year	Poland	EU	EU Max	EU Min
2010	316	503	696	305
2013	297	481	747	272
2016	307	489	815	307
2019	336	502	844	280

Source: data according to the Eurostat (2020)

The level of energy consumption in households is an important pattern of sustainable consumption. Power consumption by households includes all power consumption for space heating, water heating and all electrical appliances. An indicator of power consumption in households per capita was used in the study, which quantifies the consumption of power by households. The analysis of Table 2 shows that the indicator of power consumption per capita in Poland is more than 2 times lower than the EU average and more than 5 times lower than in Sweden, where consumption per capita was the highest.

One of the reasons for lower power consumption is the awareness of the need to reduce it. Surveys show that 90% of Poles declare limiting their power consumption. One way is to have energy-saving household appliances that are used (e.g. fridge, washing machine, etc.) (92%). Another method is to turn off the TV, computer, radio from the power supply when not in use. Such action is taken by 58% of the respondents (CBOS 2020).

**Table 2 Power consumption in households per capita**

Year	Poland	EU	EU Max	EU Min
2005	2.4	5.9	17.0	1.6
2010	2.7	6.0	15.5	2.0
2013	2.7	5.9	14.3	2.1
2018	2,2	-	9.5	1,7

Source: data according to Statistics Poland (2015), Electricity consumption per dwelling, <https://www.odyssee-mure.eu/publications/efficiency-by-sector/households/electricity-consumption-dwelling.html>

Responsibility for the natural environment also manifests itself in saving water. The analysis of the water consumption indicator per capita shows that that in Poland, on

average, about 100 litres are consumed per capita per day, which is less than in Germany (123 l), Great Britain (167 l) or the Netherlands (132 l). However, more than Romania (85 l) (Statistics Poland 2020). Despite the lower rate in Poland compared to most EU countries, water consumption is at a high level. The analysis of research related to behaviour relating to saving water shows that the inhabitants of Poland point out that it is necessary to limit water consumption in their households. Such behaviour is undertaken by 89% of respondents (CBOS 2020). One way to reduce water consumption is to turn off the water tap while washing the dishes. This way of saving water is typical for 70% of Poles (Bylok 2018).

Air pollution is an important indicator of the ecological footprint of consumption. One of its causes is the number and age of passenger cars. Passenger cars are a source of pollution, noise and waste. Limiting the use of passenger cars, especially older ones, in favour of public transport is an important model of sustainable consumption. In order to research this consumption pattern, the indicator of the share of the number of passenger cars by specific age groups in the total number of passenger cars was used (Table 3).

**Table 3 Structure of passenger cars by age groups (%)**

	2011	2012	2013	2014
Up to 1 year	2.5	2.6	2.5	2.6
2-5.	8.3	7.7	7.0	6.4
6-9	12.0	11.8	11.8	11.6
10-15	31.4	29.2	27.4	26.2
16-20	9.6	10.8	11.6	12.0
21 and over	16.5	17.6	18.6	19.3

Source: data according to the Statistics Poland (2015)

In Poland, the constant growth of cars older than 10 years is a negative phenomenon. Due to the solutions used, such cars have a negative impact on the condition and quality of the environment and road safety. Despite Poles declaring that they give up driving as much as possible and instead ride a bicycle, take the bus or train (47%) (CBOS 2020), an increase in the number of registered cars is observed. Compared to 2018, in 2019 there was an increase of 4.1% in the registered passenger cars and cars with a permissible total weight of up to 3.5 tons. Currently, 3.3 million trucks and 1,428,299 motorcycles are registered in Poland (Statistics Poland 2020).

Behaviour related to food consumption is a model of sustainable consumption. A responsible consumer makes an effort to limit meat consumption, due to the negative

impact of breeding cattle, pigs and poultry on the production of greenhouse gas. In Poland, meat consumption has been growing gradually. The meat consumption rate per capita increased from 73.7 kg in 2010 to 77.1 kg in 2019. In particular, the consumption of beef increased by 58%. Consumption of red meat per person amounted to 34.4 kg per capita in the household (Statistics Poland 2020) and is lower than the consumption of red meat in the EU, which ranges from 35.3 kg per capita per year in Bulgaria to 68.3 kg per capita per year in Spain. Average EU consumption of 57.6 kilograms per capita per year. As compared to consumers from other EU countries, where 6.2% gave up meat consumption and 35.4% reduced the consumption of red meat due to environmental protection in Poland only 8% of consumers significantly has reduced the consumption of meat (CBOS 2020).

Limiting meat consumption usually increases the consumption of vegetables. However, in Poland this dependence does not occur, because the consumption of vegetables has not increased for several years. The consumption rate per capita was 106 kg in 2019 and was 3 kg lower than in 2010 (Statistics Poland 2020).

A responsible consumer buys food products reasonably, i.e. only purchases those that are currently needed. In Poland 56%, of respondents share the following opinion: *"I buy as much food as I need without wasting any"* (CBOS 2020). Other studies show that a quarter of Poles admit that in the last seven days their households have thrown food away; 7% say it happened several times, and almost every fifth person (19%) believe it happened once in the last week. The most commonly thrown food products are vegetables and fruits (17%), bread (17%), leftovers from meals, i.e. leftovers from lunch, dinner (16%) as well as cold cuts, meat and its products, e.g. cans, canned food (10%) (CBOS 2016).

The potential of popularizing sustainable consumption patterns in Poland is evidenced by consumers' declarations that they pay attention to the ecological origin of products and the readiness to modify their purchasing habits, taking into account the idea of "sustainable consumption". In Poland, a relatively large percentage of consumers declare that they pay attention to eco-friendly origin when buying products (69% of respondents). If we take into account the socio-demographic characteristics of consumers, men (71%), aged 60 and more (81%), with secondary education (72%) pay attention to the eco-friendliness of products relatively more often. This attitude is least often displayed by young people aged 18-29 (64%), with higher education (65%). On the other hand, readiness to modify shopping habits, taking into account the idea of "sustainable consumption", is declared by 84% of Poles surveyed, while 46% of respondents definitely expressed such readiness. A detailed analysis of this indicator, taking into account the socio-demographic characteristics of the respondents, indicates that men are usually ready to modify their consumption behaviour in favour of sustainable consumption (51% indicate definitely yes), aged 40-49 (51%) and aged 18- 29 years (50%), with higher education (52%) (Bylok 2018).

Generalizing the discussed research results, it can be concluded that the elements of sustainable consumption, i.e. the amount of electricity consumption, water consumption, the use of older cars, the amount of municipal waste negatively affect the ecological footprint of consumption in Poland. The analyses of the World Wide Fund for Nature (2016) show that the ecological footprint of Poland is on average 4 gha/person, and the biological capacity is 2.1 gha/person, which means that people in Poland use almost twice as much resources as the Earth could offer if everyone enjoyed its riches equally. In the ranking of OECD countries, Poland takes the 33rd place. Such a low position results from the fact that the combustion of coal and brown coal is used to a large extent to obtain power.

## **Discussion**

Excessive consumption creates an ecological footprint of consumption which is relatively high in Poland (World Wide Fund for Nature 2016). Despite discussions on the need to reduce consumption in Poland and other EU countries, a continuous increase in the acquisition of products can be observed, e.g. EU household expenditure on household appliances increased by almost 30% in the years 1998- 2008, whilst 80% of purchased appliances being thrown away when breaks down (Potočník 2014). One way to reduce the ecological footprint of consumption is to promote the patterns of sustainable consumption. In Poland, there is an increase in the declarative use of sustainable consumption patterns, in particular the purchase of ecological products (CBOS 2020), which suggests that the awareness of social responsibility for the natural environment among consumers is spreading and affect the purchase and the use of environmentally friendly goods. However, when drawing conclusions from the research on sustainable consumption, one should take into consideration the discrepancies between the declarations and the actual consumer behavior. Carrington et al. (2014), focusing on these discrepancies between ethical intentions of consumption and actual behavior, found that embedded "unethical" shopping habits are multi-layered, associated with complex sequences of behavior, and therefore difficult to break. Similarly, the analyses of studies of environmental awareness as well as attitudes and behaviors of Polish consumers indicate significant discrepancies between consumer declarations reflecting high environmental awareness and readiness to pro-ecological behaviors and the actually undertaken behaviors (Rumianowska 2013). This situation also occurs in other EU countries (European Commission 2017).

Despite the discrepancies in the studies of behaviors characteristic of sustainable consumption, a conclusion can be drawn about its significant potential. This is particularly evident in highly developed countries, where the size of sustainable consumption and its market value volume are gradually increasing (Triodos Bank 2017).

## Conclusion

The research regarding the scope of sustainable consumption patterns in Poland shows that Poles declare their application in consumer behaviours in practice. This relates to behaviours associated with saving power, water as well as the production and segregation of post-consumer waste. The spread of consumption patterns related to eco-friendly products is visible to a large extent among older people, who have a great potential to change towards sustainable consumption. The ecological awareness of Poles is growing in favour of changing the patterns of consumption behaviour. Consumers declare that they pay attention to the ecological origin of products and express their readiness to modify their shopping habits, taking into account the idea of "sustainable consumption". However, the application of behaviour patterns related to the reduction of red meat consumption and collaborative consumption is not observed. The behaviour related to limiting the use of a passenger car in favour of public transport is also not noticed. Despite the declaration that they use this transport more and more often, the above is not confirmed by the statistical data. There are discrepancies between the declarations of the respondents and the statistical data.

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# THE PERSPECTIVE OF CIRCULAR FOOD WASTE MANAGEMENT IN THE COMBINED CASE OF BAKERY AND BREWERY

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**Abstract:** This work is focused on issues related to the circular economy of gastronomic waste, namely the reuse of residual products from bakeries in beer production in order to reduce the amount of waste from bakery leftovers and their use as a substitute for malt in brewing. The main aim is to verify the possibility of using bakery leftovers with the help of fermentation technologies (the production of alcoholic beverage from the bakery leftovers). Bakery leftovers in the form of ordinary bread are obtained from the bakery pilot plant. After the analyses, these leftovers are used for beer production.

Conducting research on the proposed topic will allow us to look at the production of beer from the perspective of the circular economy in the food industry and to promote more environmentally friendly food use.

In conclusion, after the sensory evaluation, we can say fullness and saturation weaken with the increasing concentration of bread and decreasing amount of malt. And there some defects of taste such as salt, kvass/yeast, diacetyl, which are caused by the composition of bread.

As a first sample, lager beer without bread substitute was used. Its lower results in total rating indicate that the evaluators have their preferences in other types of beer.

Sample 5 (40:60), 6 (50:50), and 7 (60:40) with the higher concentration of bread were rated the lowest in the total rating.

Sample 2 (10:90) and 3 (20:80) with the lower concentration of bread were rated the highest in the total rating.

**Keywords:** gastronomic waste, brewery, bakery leftovers

**JEL Index:** M11, Q01, Q53

## Introduction

Today, beer has become the world's most popular alcoholic beverage. In 2003, worldwide beer consumption was 1,444,087,000 hectolitres (Stack et al. 2016, p. 64) and its amount increased to 1,91 bn hl in 2019 (Statista 2021). The partial use of bakery leftovers for beer production instead of malt will solve two problems: the waste of bakery leftovers and the loss of resources for growing barley for beer production. Small breweries such as Toast Ale, Crumbs Brewing in Great Britain and Brussels Beer Project in Belgium brew their beer with bread leftovers which replace some of the malted barley.

Food waste is a major topic in the circular economy, which attempts to reduce carbon footprint and improve eco-efficiency (Mak et al. 2019, p. 2). In 2018 was wasted 347 million tons of cereals worldwide (Hegnsholt et al. 2018, p. 2).

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Brewing beer as bread baking is an ancient process. The beer was created approximately 10,000 years ago in the Middle East. Some historians say, that beer was created by bread that was wet and laid for some time. Thankfully to yeast in the bread, the fermentation process started. As a result, people obtained alcohol. The components of the beer were determined by the location, where people lived and the availability of the products. For example, in America for brewing beer people used sweet potato, rice in eastern Asia and sorghum in Africa (Denny 2009, p. 14). Also in some Slavic countries exists an ancient drink named Kvass, which is made from bread, water, and sugar.

The research part of the work deals with the production of beer from bread leftovers in the brewery and laboratory tests. It is necessary to focus on the composition of bakery products, their substitute quantity used in the production of beer in relation to enzymes that are already in malt. It is necessary to ask the question - if malt enzymes break down bakery leftovers without the rest of the material. In the case of a negative result, commercial amylase, protease and lipase based enzymes will be used to fully saccharify the material and eliminate surrogate residues. Subsequent work is optimization when the conditions are tuned malt/bakery leftovers in relation to mashing temperature/time and mash composition in relation to additional external enzymes.

A study (Brancoli et al. 2020) showed that the production of beer from bread has large environmental savings in eighteen impact categories, compared to other options for processing bread residues. Savings observed in beer production, e.g. 0.46 kg eq. CO<sub>2</sub> in the global warming category is the result of replacing malted barley with surplus bread (Brancoli et al. 2020). This is the first study of using bread leftovers and waste that can be used for developing and enhancement circular food waste management.

## Methodology

Bakery leftovers in the form of ordinary bread are obtained from the bakery pilot plant. After the analyses of the composition of each type of bread, e.g. (Table 1), leftovers were used for beer production. We used bread after its expiration date.

**Table 1. Chemical composition of the bread used for beer production**

	Wheat bread	Rye bread
Nutritional information:	In 100 g:	In 100 g:
Energy	1062 kJ/253kcal	896 kJ/214kcal
Fats:	2,0 g	0,8 g
saturated fatty acids	0,3 g	0,1 g
Carbohydrates:	51 g	45 g
sugar	3,6 g	0,9 g
Proteins	9,0 g	6 g
Salt	1,3 g	1 g

For brewing purposes, wheat-rye and wheat fresh bread were used. We counted how much dry bread we need and then we subtracted 40% of the water that is in fresh bread.

Example of counting the ratio:

The ratio of bread to malt 20:80

The total amount of malt 3124 g

$3124 \times 80\% = 2\,499,2$  g (malt)

$3124 \times 20\% = 624,8$  g (dry bread)

40% of water in fresh bread

60% of dry matter in fresh bread

dry bread/60% of dry matter in fresh bread = fresh bread

$624,8 / 60\% = 1041,3$  g (fresh bread)

We used the ratio of bread to malt from 10:90 to 60:40, e.g. (Table 2). We didn't go below these ratios, because of the results that we get and it's not needed to use more amount of bread in relation to malt in this experiment.

**Table 2. The ratio of bread to malt**

Sample	Type of bread	Bread/Malt (%)	Bread, dry matter (g)	Malt (g)	Water (l)
1	-	00:100	-	3124	20
2	wheat-rye	10:90	312	2811	20
3	wheat-rye	20:80	624	2499	20
4	wheat-rye	30:70	937	2187	20
5	wheat	40:60	1249	1874	20
6	wheat-rye	50:50	1562	1562	20
7	wheat	60:40	1874	1249	20

We had 3 times hopping. We used Sladek ( $\alpha$ -bitter acids = 4,5-7,0 % w.) for first and second hopping and Saaz (ŽPČ) ( $\alpha$ -bitter acids = 2,5-4,0 % w.) for the last hopping, e.g. (Table 3). The international bittering unit (IBU) in beer is 21.6.

**Table 3. The ratio of hops**

Name	First hopping 00:00	Second hopping 45:00	Third hopping 90:00
Sladek	9 g	11 g	
Saaz			30 g

The work process of brewing lager beer with the bread substitute:

1. Malt (%) + 11 l of water (40 ° C) + fresh bread (%) = cook for 10 minutes and stirring.
2. Increase heat to 52 ° C for 10 min - "protein rest" (Steiner et al. 2011).
3. Increase heat to 62 ° C for 30 min - " $\beta$ -amylase rest" (Hui 2007).
4. Increase the heat to 72 ° C for 30 min - "saccharification rest" (Hui 2007).
5. Increase the heat to 85 ° C for 5 min.

6. The liquid is sieved into the draining tub. Pour 5 litres of water (85 ° C) used on a sieve and left for 15 minutes.
7. Added 11 l of water to the sieve and poured the drained malt into the cooking vessel.
8. In the cooking vessel, cooked the drained malt at 100 ° C for 90 min.
9. Hopping 90 min.
10. 20 minutes it stands.
11. Strained through a small sieve from the cooking vessel.
12. Cool the liquid to 12-16 ° C.
13. Add yeast (Saflager W 34/70). Aeration.
14. Refrigerate at 12 ° C for 14 days.
15. After 14 days, beer is transferred to the bottles with added sugar. Refrigerated at 12 ° C for 20 days.

## Results

We examined 7 samples of beer on the device for the automatic analysis of beer Funke Gerber FermentoFlash, e.g. (Table 4).

**Table 4. Physical evaluation of beer**

Sample	Alcohol (weight %)	Alcohol (vol. %)	True extract (%)	Virtual extract (%)	Original wort (%)
1	4.36	5.25	3.41	3.24	11.53
2	4.21	5.11	4.41	4.91	12.37
3	4.60	5.59	5.14	5.86	13.85
4	4.46	5.39	4.25	4.53	12.62
5	3.88	4.72	4.61	5.38	11.98
6	3.33	4.05	4.05	4.77	10.38
7	5.07	6.13	4.92	5.29	14.45

We conducted the sensory evaluation of beer with 5 evaluators (one woman and four men). We had 7 samples of beer. The evaluation was from 1 to 10 points (10 was the highest), e.g. (Table 5 and 6).

**Table 5. Sensory evaluation of beer**

Sample	Bread/Malt (%)	Aroma	Taste	Drinkability	Total rating	EBC
1	00:100	5.8	5.8	6.8	6.2	6-8
2	10:90	5.2	6.6	6.8	7	8-12
3	20:80	5.6	6.8	6.6	7	8-12
4	30:70	5.2	6.6	6.8	6.2	8-12
5	40:60	5.6	5.8	5.4	5.6	4-6
6	50:50	5	5.6	4.4	4.4	4-6
7	60:40	3.2	3.2	3	3.2	6-8

**Table 6. Sensory evaluation of beer**

Sample	Foam	Fullness	Saturation	Defects
1	White, foamy, dry	middle	middle	-
2	White, foamy, dry	middle	middle	-
3	White, foamy, dry	strong	strong	-
4	White, foamy, dry	middle	middle	-
5	White, foamy, dry	weak	weak	Salt
6	White, foamy, dry	weak	weak	Kvass, salt
7	White, foamy, dry	weak	weak	Salt, diacetyl

As a first sample, we had lager beer without bread substitute. Its lower results in total rating indicate that the evaluators have their preferences in other types of beer. They evaluated this lager beer from 3 to 9 points in the total rating.

Sample 2 (10:90) and 3 (20:80) were rated the highest in the total rating.

Sample 5 (40:60), 6 (50:50), and 7 (60:40) were rated the lowest in the total rating.

Also, we analysed few samples of beer and fresh water on some chemical elements and parameters (Table 7).

**Table 7. Chemical composition of beers and the water used for brewing**

Description	water	0:100	20:80	40:60	50:50
pH	7.3	4,6	4,5	4,5	4,4
Cl-	19,9	141	821	1200	985
SO <sub>4</sub> <sup>2-</sup>	<0,5	72,4	73,6	55,6	52,6
KNK 4.5	3,85	1,43	<0,15	0,57	<0,15
KNK 8.3	<0,15	<0,15	<0,15	<0,15	<0,15
HCO <sub>3</sub>	235	87	<3	35	<3
CO <sub>3</sub>	<3	<3	<3	<3	<3
Ca	98,5	95,5	98,2	152	136
K	1,44	514	631	326	389
Mg	3,46	114	150	107	113
Na	2,73	14,9	450	727	586

## Discussion

We started this project work because of the absence of research on this topic, that's why it's problematic to find literature and articles about brewing beer from bread or similar materials.

A study (Brancoli et al. 2020) showed that the production of beer from bread has large environmental savings in sixteen impact categories, compared to other options for processing bread residues: source reduction, donation, animal feed production, ethanol production, anaerobic digestion, and incineration. The functional unit of the study is the prevention of 1 kg of surplus bread in Sweden. The savings observed from beer production, e.g. 0.46 kg CO<sub>2</sub> eq in the global warming category is the result of replacing malted barley with surplus bread (Brancoli et al. 2020). In this

research, two recipes were used. The first from the brewery Toast Ale which brews their beer with surplus bread which replaces up to 30% of barley. The second from the 11th International Conference on Life Cycle Assessment of Food (LCA Food 2018; Almeida et al. 2018). Brancoli et al. used fresh bread as we did, for the energy economy instead of drying bread in the oven. They used just up to 30% of bread substitute as in recipes they used, in return, we used our original recipe and tried to substitute barley with bread up to 60%.

Small breweries that have open access to their recipes, don't use more than 30% of bread substitutes in their beers.

Estevão et al. 2021 in the study used malt substitute such as sorghum (45%), rye malt (45%), maize (45%), rice (45%), and oat malt (45%).

## Conclusion

As a first sample, we had lager beer without bread substitute. Its lower results in total rating indicate that the evaluators have their preferences in other types of beer. They evaluated this lager beer from 3 to 9 points in the total rating.

Sample 2 (10:90) and 3 (20:80) were rated the highest in the total rating.

Sample 5 (40:60), 6 (50:50), and 7 (60:40) were rated the lowest in the total rating.

To conclude, fullness and saturation weaken with the increasing concentration of bread and decreasing amount of malt. And there some defects of taste such as salt, kvass/yeast, diacetyl, which are caused by the composition of bread.

The weaker fullness in samples 5, 6, and 7 indicates that the lower amount of malt in these samples and lower amount of extracted enzymes from malt, make the beer body weaker. The bread itself, cannot provide that amount of enzymes that make the strong fullness of beer. In proceeding research, we will use commercial amylase, protease and lipase based enzymes to fully saccharification.

Further research must be directed to optimization the conditions between malt and bakery leftovers considering the mashing temperature and time and mash composition in relation to additional external enzymes.

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# POSSIBILITIES OF WASTE REDUCTION IN GASTRONOMY AND FOOD INDUSTRY IN THE CONTEXT OF CIRCULAR ECONOMY

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**Abstract:** The aim of the article is to propose approaches to waste reduction in gastronomy and food industry in the context of the White Paper for Hospitality in Europe: 2019–2024 EU Mandate and the circular economy. White Paper presents the industry's top five priorities – Collaborative economy, Better regulation, Digital, Food Policy and Social Affairs. The priority Food Policy shows that voluntary measures, as the ones which took the European hospitality industry together with the European Food Banks Federation (FEBA) to reduce food waste and develop food donations, are proving their effectiveness and therefore favourably replace European-wide legislation in this case. Waste in gastronomy and food industry can be classified into two areas, organic and inorganic waste. Organic waste constitutes a percentage of purchased but unused food and directly translates into the finances of customers. Inorganic waste is more dangerous because it is associated mainly with the packaging necessary for packing food to go. The possibilities of reducing waste in gastronomy are summarized based on own primary and secondary research. Better knowledge of options of residual foodstuffs disposing/management could be achieved not only by explaining legislation and real options of disposing waste but also by providing various recommendations and ideas to restrict residual foodstuffs and food waste.

**Key words:** circular economy, food industry, gastronomy, residual materials, waste management

## Introduction

Food service industry waste is a growing problem worldwide. Yet, according to Condamine (2020) of Zero Waste Europe, almost 50 % of food waste does not occur in our refrigerators, but rather in the steps before consumption, from production to food service. For example, around 30 % of food waste in Europe is generated in the production and processing steps (Nestle, 2013).

The HORECA segment is a significant waste producer. Very few catering companies sort all types of waste and implement waste reduction principles. This is why this segment is important in the search for a more responsible and sustainable way with the application of circular economy principles. An important document is the White Paper for Hospitality in Europe: 2019–2024 EU Mandate (HOTREC, 2019) and the 3Rs (reuse, reduce, recycle) principles mentioned therein.

The aim of the thesis is to propose approaches leading to waste reduction in the food service industry in the context of the White Paper and the circular economy. The research questions and hypotheses are defined as follows:

1. What are the opportunities for reducing waste in the food service industry in the world and in our country?

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2. What can motivate food service industry operations and what are the potential barriers?

H1 – We believe that there is more practice in reducing waste in the food service industry abroad than in the Czech Republic.

H2 – We assume that food service industry operations in the Czech Republic are not motivated to reduce waste.

In recent decades, sustainable development has penetrated the food service industry as well — food waste is a global problem right now. According to a 2013 UN report, 1.3 billion tonnes of food are thrown away or spoiled worldwide annually, a third of total food production, and worth nearly £20 trillion. Of this, around 300 million tonnes of food is still fit for consumption. In Europe, 95–115 kg of food per capita is wasted each year.

In the Czech Republic, this trend in gastronomy has only emerged in recent years. Food waste is particularly serious at the agricultural and household level, but food service establishments also contribute to it to some extent. Waste in restaurants is not the most voluminous, but they could still reduce its volume and prevent unnecessary waste. Closely related to the further use of residual raw materials is the principle of Zero Waste, i.e., processing raw materials so that no or minimal residues are generated.

### **Literature review / Research Background**

The term "food service industry" includes any company that manufactures, processes, sells and serves food, beverages and nutritional supplements. It refers to all stages of the process, including design, construction, maintenance and delivery of solutions to customers in the animal nutrition and food industry (food and beverage) (Hlavatá, 2018, Vezérová, 2021). The food industry has different characteristics compared to other manufacturing industries. According to McIntosh et al. (2010), there are several factors to distinguish between the food industry and other manufacturing industries. These include chemical change, ripening cycles, delay and decomposition of the food product. Gastronomy is concerned with the influences (mainly culture and environment) that affect people's diets from the selection of ingredients to the way they are finally consumed.

As the EU's largest manufacturing sector, the food and drink sector represents an important pillar of the EU economy with a turnover of €965 billion and contributes 2 % of GDP. Half of the sector's turnover is produced by small and medium-sized enterprises, which form a crucial part of the business base and process the bulk of agricultural production. The sector has a positive trade balance in the EU and employs 4.4 million people. In the Czech Republic, food and beverage production contributes 2.7 % of GDP. Similarly to the EU, the sector is a mainstay of the manufacturing industry in the Czech Republic, with a diversified size structure of enterprises. The importance of the food industry is primarily due to the fact that it ensures the nutrition of the population by producing products that are safe for health, of high quality and widely available, including regional specialities and organic food. On the other hand, this sector, together with the gastronomy, is characterised by a

high proportion of waste produced, which consists mainly of organic residues from processed raw materials and also packaging that has been used to protect against potential pathogenic influences (EU-MERCI, 2020).

For the past 150 years our industrial economy has been dominated by a one-way production and consumption model in which goods are produced from raw materials, sold, used and then burned or thrown away as waste. With a growing global population and the associated increasing consumption of resources and negative environmental impacts, it is becoming increasingly apparent that the current way of doing business is no longer suitable for a sustainable future. While the concept of a circular economy has been discussed since the 1970s, the transition from the current linear economic model to a circular model has recently attracted increased attention from major global corporations and policy makers. The circular economy emphasizes process redesigning and materials recycling that can contribute to more sustainable business models and maximize ecosystem functioning and human well-being (Korhonen et al. 2018). The identification of the environment for evaluation and development of culinary tourism is an important step in this strategic decision-making process from which they are derived development of products, choice of price tools and other tasks of the destination management focused on health and human well-being (Plzáková, Stupková, 2019). New trends in tourism involve tourism demand individualization, the need for greater flexibility in decision-making, accelerated selection, booking and payment for services, and last but not least, immediate feedback from customers (Plzáková, Studnička, 2021).

According to Fiedor (2012), most human activities generate waste and its amount has recently been increasing in a still more rapid way. With the volume, the diversity increases as well. The concept of Zero Waste comes from the highly successful Japanese industrial concept of total quality management. Transferred to the municipal waste sector, Zero Waste draws attention to the entire product life cycle (Murray 2002).

Gastro waste is an inherently large part of the waste stream and has been the focus of many studies in recent years. According to the European Parliament (2017), one-fifth of all food produced in Europe becomes waste, equivalent to 88 million tonnes of food per year. This means that 92 kilograms of food per capita are thrown away each year. The European Commission (2020) reports that the EU Circular Economy Action Plan aims to help achieve the Global Sustainable Development Goal target of halving per capita food waste at retail and consumer level by 2030 and reducing food loss in production and supply chains.

In gastronomy, we think of packaging waste from raw materials and waste from disposable takeaway packaging. The use of single-use plastic packaging increases convenience, promotes on-the-go culture and in some cases extends shelf life. Packaging waste has grown along with food waste, which poses a huge challenge. Since the use of plastic food packaging became commonplace in Europe in the 1950s, levels of plastic packaging and food waste per capita have risen simultaneously, with annual levels exceeding 15 million tonnes or 30 kg of plastic packaging waste per capita. While both food and packaging waste have started to

decline in recent years, the amount per capita remains at its highest level on record (IEEP 2018).

## Methodology

In-house research was used to test the above stated hypotheses. As the own research is not sufficient to fulfil the objectives, it was necessary to conduct a structured interview with the project manager Barbora Kebova (2020), who is in charge of gastronomy at the Institute of Circular Economy and is an expert in this field. The interview was based on pre-prepared questions:

1. Do you think that companies operating in the catering and food industry in the Czech Republic are sufficiently involved in waste reduction?
2. What do you think are the most effective solutions to reduce waste?
3. Which part of the process generates the most waste? Why?
4. Do you know of any technologies and innovations that help in waste prevention?

The research methods used in this thesis were a comparison of individual examples of good practice, analysis of professional documents, structured interview, evaluation of the interview with a comparison of the actual research.

## Results

In 2018, the non-profit organisation Zachraň jídlo participated in the research project Reducing Food Waste in Public Catering (RedPot), which was co-operated by the Technology Centre of the CAS, Median and the Institute of Agricultural Economics and Information. The resulting materials are intended to help catering businesses, government and non-profit and other organisations that want to reduce their food loss and waste for environmental or economic reasons. Canteens could save money by using an ordering system and adjusting portion sizes. Fast food businesses should review their strict corporate standards for food quality.

How canteens and fast food outlets can reduce the amount of food they throw away: (1) stock control – overview of food stocks, longer shelf life, (2) enable norms – if possible, extend the time of serving food, (3) involve staff – regular training and supervision of more experienced newcomers, (4) inform customers – avoid wastage, regular satisfaction survey, (5) entice with a discount – using e.g. Nesnězeno or Jídlo apps, (6) utilize technology – vacuum packaging and portion cooling, (7) donate raw materials and portions — subject to meeting hygiene standards, (8) sort – separate bio-waste, sorted waste is cheaper to take away, (9) plan – use ordering systems and (10) adjust portions – offer smaller portions; show pictures rather than exposed sample portions.

Zachraň jídlo released its first cookbook in 2019, listing recipes with the goal of not wasting and using every part of the food. The organization also offers corporate packages for businesses where employees gain knowledge on how to prevent and utilize food waste (Table 1).

**Table 1. SWOT analysis of the current state of involment in waste reduction in the food service industry**

Threats	Opportunities
Insufficient package free assortment of larger suppliers Rising waste disposal charges	Customer education Waste monitoring Smaller package free suppliers, farmers Savings of waste collection Consultancy
Weaknesses	Strenghts
Time options Internal measures Lack of innovation, technology	Motivation of employees Motivation of owners Better reputation

Source: own processing

The food service industry produces a large amount of diverse waste on a daily basis. In our experience, the largest part is made up of packaging materials – be it plastics, paper, glass, beverage cartons or metals. And there is no shortage of organic waste either. Reduction of food waste depends mainly on its monitoring, effective menu planning and composition, and the skills of the staff. It can therefore be substantially reduced by internal measures within the operation.

For packaging waste, of course, it helps to buy in larger packages (but so that food doesn't go bad before the kitchen can use it) or in more concentrated forms – for example, for cleaning products. When it comes to mixed waste, it is important to sort it consistently and motivate your own staff to do so. An effective on-site bin system may be helpful for staff in making sorting as easy as possible. In most food service establishments, most waste is generated in the preparation area – in the kitchen and behind the bar. This is where most of the packaging materials come from as well as most of the organic waste in the form of food scraps and leftovers.

Systems such as Winnow or LeanPath help to monitor and reduce food waste in food service operations. There are also systems for single-use, returnable and reusable dish ware systems such as ReKrabička. Prepared meals are being saved from waste by "rescue" apps such as TooGoodToGo or the Czech Nesnězeno. Packaging doesn't always have to be bad if it helps to extend the shelf life of food or save food from being thrown away by someone taking it home. There are a number of innovations in packaging technology in general today, whether targeting the durability of food or the recyclability of the materials used.

## Discussion

According to Act No. 185/2001 Coll., on Waste, waste is "*any movable thing that a person gets rid of or intends to get rid of*". Waste itself can be divided into different aspects. The division can be aided by Decree No. 93/2016 Coll., on the Waste Catalogue, which distinguishes waste as hazardous and other waste, and further divides it into a total of twenty waste groups, which contain almost a thousand types of waste. For biodegradable waste from kitchens and food service establishments,

the term gastrowaste is currently used. In the waste catalogue, it is in the municipal waste section under the number 20 01 28. Such waste can be, for example, leftovers from production and consumption, products that are not of the required quality, expired products or contaminated materials.

Waste management supports the operators in prevention of the very generation of excessive waste, which is not only the statutory obligation, but also the basic pillar of sustainable development. Act No 185/2001 Coll., on waste, lays down the obligation to follow a sequence of waste management methods: (1) waste prevention (economical behaviour in waste production), (2) preparing for re-use (finding alternative uses), (3) recycling (using waste to create new products), (4) other uses of waste (e.g. energy production), (5) waste disposal (only otherwise unusable waste).

Due to legislative restrictions, it is almost impossible to use unused raw materials in a food service industry. For example, the regulation lays down the conditions for using kitchen waste for feeding.

Most of the international research on food waste started after 2000. Selected studies show that reducing residual raw materials is quite difficult for food service establishments (especially in institutional catering). Solutions may include menu adjustments, smaller portions or more effective marketing to encourage non-waste. The authors of the study *Biting Off More Than They Can Chew – Food Waste at Hotel Breakfast Buffets* (Juvan, Grün, Dolnicar, 2018) focus on the food waste generated by breakfast buffets in hotels. Another interesting foreign study on this topic is *Can Marketing Help in Tackling Food Waste?: Proposals in Developed Countries* (Calvo-Porrá, Faina, Losada-Lopez, 2017). This study explores how appropriate marketing could lead to a reduction in food waste. It starts from the fact that waste occurs at all stages of the supply chain and that purchasing behaviour in developed countries has reached a stage where a culture of not producing leftovers has turned into a society where waste is now accepted as a part of life. The Danish study *Reducing Food Waste in Large-Scale Institutions and Hospitals: Insights From Interviews With Danish Foodservice Professionals* (Ofei et al., 2015) explores the experiences of food service professionals and their strategies for reducing food waste in large institutional kitchens

Food waste is particularly serious in developed countries, where it occurs at the level of sale and consumption (as opposed to developing countries, where almost half of the losses occur at the processing stage). In developed countries, wastage is most significant at the consumption level (most food waste is from households) and is mainly due to consumer purchasing behaviour and habits, together with cultural and social factors. The consumer society, combined with efficient production and mass marketing, leads to serious food waste and it is for these reasons that appropriate marketing could help to address this problem. In the context of catering, the study draws particular attention to the production of more food than is ultimately necessary in buffet establishments. It also identifies the three most common causes of food waste in restaurants: poor storage and subsequent spoilage, poor planning of meal numbers leading to more food being prepared than is consumed, and failure to process food already prepared, but not served.

## Conclusion

The issue of waste in the food service industry is a global problem with a large enough contribution to climate change. Yet the number of people who do not have access to food is staggering. Many businesses do not yet know how to approach and prevent waste. The time and money invested ends up in landfill sites and never fulfils its potential.

Food waste is a global problem and in the Czech Republic it is only in recent years that it has become more prominent. In the gastronomy sector, international trends such as taste waste or zero waste have only recently emerged and have been slow to come to public attention. However, the survey shows that restaurant operators have always applied zero waste principles to varying degrees in their businesses. Operators do not try to reduce residual raw materials so much for environmental reasons as for economic and cost-saving reasons. Thus, on the part of operators, saving raw materials is natural and essentially unconscious. However, society should, above all, talk and inform more about this issue so that people start thinking more about waste and try to reduce it. Restaurant and canteen operators should also be made more aware of zero-waste practices and the possibilities for managing residual raw materials, as they may not be aware of them or have nowhere to learn about them.

In many cases, it is also the guests themselves who are behind the waste in restaurants. Waste at the production level can be kept to a minimum by the restaurant, but reducing waste at the sales level is more difficult. Implementing measures to reduce waste by guests can also be problematic, as it could discourage guests from visiting again or worsen the restaurant's reputation and discourage new guests from visiting. Operators may also be discouraged by the time and security involved in some measures.

Waste in food services has not been significantly addressed in the Czech Republic and is a relatively new topic. Gradually, projects and trends concerning waste in restaurants are beginning to emerge, but there is also a tendency towards a deeper investigation of the current situation. Restaurant operators themselves should focus more on waste and start reducing residual raw materials, but also informing guests about the issue. The main point now is that even if individual operators contribute minimally to the overall reduction of leftovers, they can inspire other businesses and consumers to think about the issue of waste.

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## SOCIAL RESPONSIBILITY FOR BANKING INSTITUTIONS

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**Abstract:** The paper is focused on the evaluation of the impacts of the implementation of Directive 2014/95 / EU in terms of the introduction of non-financial information into Czech accounting legislation, specifically the Accounting Act with effect from 2017. The subject of this research are financial institutions, specifically commercial banks based in the Czech Republic. Banks such as public interest entities must operate not only monitor and manage credit risk, which results from their active subject matter, but along with it the risk of long-term sustainability in a comprehensive and consistent. This requirement is fulfilled by the regular reporting of non-financial information by banks. Transparent disclosure of this information should help to eliminate banking risks and creating greater credibility, which is crucial for banks. Trendy sustainability should be fully consistent with the principles of business and commercial activities.

**Purpose:** The aim of the paper is to evaluate the benefits of the implementation of the Directive in the Accounting Act on the quantity and quality of reported non-financial information by banks operating in the Czech Republic. The paper evaluates and compares approaches to this fact not only for banks that have this obligation, but also for banks that do not have this obligation. There was also a comparison of the reporting rate of non-financial information by banks within the Visegrad countries.

**Methodology:** Based on Directive 2014/95 / EU and the EUKI 2020 database, key indicators in the area of non-financial reporting were identified, for which the level of their reporting by the monitored banks was subsequently monitored. It has established five basic areas, ie. The environment, social issues, employees, respect for human rights and the fight against corruption and bribery. Within individual areas, partial indicators were defined and subsequently monitored. The starting point was the content analysis of banks' annual reports. All banks in the Czech Republic (a total of 48 banks) were analyzed, which were then divided into three basic groups. These are banks with an obligation to disclose non-financial information, banks that are defined as large entities and a group of other banks according to the Accounting Act. After the identification of defined areas and the content analysis of the annual reports, the quantity and quality of non-financial reporting for the monitored groups of banks were evaluated. These results were compared with data obtained from the EUKI database for banks in other V4 countries.

**Findings:** Significant differences were found between the reporting of non-financial information by banks with the obligation to report, when a growing trend can be noted in the quality and quantity of reported non-financial information. This cannot be confirmed for banks that do not have this obligation. It should be added that some smaller banks, despite their importance, still do not report non-financial information. It was also found that when reporting non-financial information by banks, there is no uniform form and content with regard to the choice of specific indicators. From the results of comparisons within other V4 countries, it was found that in comparison with the Czech Republic, non-financial information is reported in more detail in Poland and Slovakia, but less in detail in Hungary.

**Keywords:** non-financial information, non-financial reporting, directive 2014/95 / EU, banks, sustainability

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## Introduction

In recent years, the importance of corporate social responsibility has been growing, which is not just a matter of the company's image, but is becoming part of business models. Thanks to this importance, a large company creates separate departments that deal with social responsibility and try to involve their employees in it. Directive 2014/95 / EU is focused on corporate social responsibility and financial institutions. According to this directive is the non-financial disclosure mandatory for public interest entities, which are also banking institutions. Banks through project financing and lending to have a big impact on today's society and therefore should be in the area to raise awareness.

The issue of social responsibility is much more common and debated in Western countries than in Central and Eastern Europe. In Western Europe, social responsibility is also more required of citizens and investors who decide to invest in banking institutions on the basis of non-financial information.

The aim of the paper is to evaluate the benefits of the implementation of the Directive in the Accounting Act on the quantity of reported non-financial information by banks operating in the Czech Republic. The article is focused on financial institutions, specifically on commercial banks and foreign branches of banks based in the Czech Republic.

## Literature review / Research Background

*„Our planet could be seen as our billion stars hotel; we are called to behave as properly and well-educated guests, and as responsible guests, we have to respect and care about our hotel and leave it in the best condition for future visitors.“* (Bedenik a Barišić, p. 120)

Transition to economy with respect to environment can be realized in three stages: including the environmental costs of carbon into the prices paid by all sectors of economy, greater information duty about environmental issues and innovation facilitating carbon replacement (ECB, 2021).

Until 2017 non-financial information were disclosed voluntarily, but on January 1 of this year Directive 2014/95/EU of the European parliament and of the Council has entered into force, this Directive amended the former Directive 2013/34/EU. According to the lawgivers disclosure of non-financial information is vital for transition towards a sustainable global economy that combines long-term profitability with social justice and environmental protection.

According to the Directive commercial undertakings and public interest entities must disclose non-financial information, if they exceed the average number of employees of 500 at the balance sheet date (EP, 2014).

Small and medium undertakings do not have the information duty. These undertakings most common disclose non-financial information about community involvement and development area. Small and medium undertakings are closer to these issues than large one (Krasodomska and Gadowska, 2020). According to Zárbybnická Žárová (2018) more than half of medium undertakings in the Czech

republic disclose non-financial information, even though the Directive is not applied to them. The audit requirements has a positive effect on non-financial reporting of small undertakings.

Gazzola and col. (2020) made a research of non-financial reporting of public interest entities. During research, a positive trend in non-financial reporting was recorded, the public interest entities increases the availability of non-financial information on its website (the number of needed „clicks“ reduced), also increases the number of published areas.

In other reasearch on non-financial reporting of public interest entities, Coşofret a kol. (2020) dealt with Romanian companies that are listed on the Stock Exchange in Bucharest. Most selected companies disclose environmental information and employee issues. On the contrary, only half of the company sample disclose information on anti-corruption issues or human rights.

Before entering the Directive 2014/95/EU into force, reporting of non-financial information had a slightly growing trend, moreover, the disclosure of non-financial information was the most common for banks (Lament, 2017). According to another research, before entering the Directive into force larger and more leveraged financial institutions were more likely to extensively disclose their non-financial information (Andrikopoulos a kol., 2014). According to Andrikopulos a col. (2014), the main cause is greater visibility and greater need of confidence by shareholders of these institutions.

Before entering the Directive into force, the European Union has not been uniform in the non-financial reporting issue. Some countries such as France, UK, Sweden, Denmark, Spain and Finland had similar regulations already implemented at national level (Caputo a kol, 2019). In general, we can say that the western Europe is more advanced in non-financial reporting. It is appropriate to mention that the Polish Government was against the implementation of the Directive and wanted to leave this issue as a completely voluntary (Krasodomska a Godowska, 2020). Within the Czech Republic this activity is also not very popular and was considered as „inefficient administrative work“ (Mikulášková a kol., 2019).

Based on some research, non-financial disclosure could be profitable for some undertakings. Lenders, for the purpose of covering their own risks, require a higher yield from borrowers with worse levels of social responsibility (Goss a Roberts, 2011). Thus, bank directors are interested in this kind of information and take into account while creating bank contracts, audit certified information then increase their credibility in the mind of bank directors (Quick a Inwinkl, 2020).

Especially shareholders, but also society generally produce considerable pressure on undertakings to commit themselves to social responsibility and from non-financial reporting do an integral part of its annual reports (Khalil a O'Sullivan, 2017). However, this pressure often leads to so called „greenwashing“, which means that companies invest more in presenting their own environmental measures than in the implementation of these measures (Pimonenko a kol., 2020). According to some studies, „greenwashing“ did not avoid banks (Khan a kol., 2020; Khalil a O'Sullivan, 2017). The subject of research more often becomes the quality of disclosed information then their quantity. P. Kahn and col. (2020) assessed the quality of non-

financial information as well as the quality of financial information, so based on their relevance and reliability.

## **Methodology**

With regard to the main objective of the paper, ie the evaluation of the impact of the implementation of Directive 2014/95 / EU into the Czech Accounting Act in relation to the quantity and quality of reported non-financial information at financial institutions (banks), data from 2016 and 2019 were selected for comparison purposes. The year 2016 was chosen as the period before the implementation of the Directive and the year 2019 represents the most recent published non-financial information by banks already after the implementation of the Directive. Identified key indicators of non-financial reporting, which have been subsequently monitored their level of reporting banks surveyed in five basic areas, ie. environment, social issues, employees, respect for human rights and the fight against corruption and bribery. The starting point was the content analysis of banks' annual reports. The collected data were analyzed in terms of frequency of occurrence of selected criteria on which an arithmetic average for the reference area. A total of 48 banks were analyzed, which were then divided into three basic groups. These are banks with an obligation to disclose non-financial information, banks that are defined as large entities under the Accounting Act, and a group of other banks. After identifying the defined areas and content analysis of annual reports was assessed by the quantity and quality of non-financial reporting for the monitored group of banks in the years. For the comparison of reporting non-financial information by banks in the Czech Republic, the results were compared with data for banks in other V4 countries, as well as Germany and France, which were obtained from the EUKI by 2020. The V4 countries were selected with regard to a similar historical development, when it comes to open economies. Germany was selected for examination as a major export partner of the V4 and France, given that it was one of the first countries to introduce mandatory non-financial reporting at national level.

## **Results**

Based on the directive, banks have an obligation to disclose information about the environment, social issues, care for employees, human rights and the fight against corruption. The data in Table 1 represent data for 2016, when the EU Directive on the Disclosure of Non-Financial Information has not yet entered into force, and for 2019, which are intended to represent the latest data and the situation in the field of corporate social responsibility.

**Table 1 The rate of non-financial information reporting entities**

Factors	Group of banks 1		Group of banks 2		Group of banks 3	
	2016	2019	2016	2019	2016	2019
The environment	35,71 %	51,79 %	11,36 %	38,64 %	6,25 %	10,00 %
Social Issues	44,64 %	57,14 %	22,73 %	31,82 %	10,00 %	10,00 %
Empolyees	52,38 %	66,67 %	24,24 %	33,33 %	15,00 %	20,00 %
Respect of human rihts	40,48 %	54,76 %	3,03 %	9,09 %	6,67 %	8,33 %
Fight against corruption and bribery	42,86 %	67,86 %	4,55 %	15,91 %	5,00 %	6,25 %

Group 1: Financial institutions with the obligation to publish financial information.

Group 2: Large financial institutions

Group 3: Other financial institutions

Only the group of banks 1 is obliged to disclose non-financial information. However, we can notice that there was an increase in reporting also for groups of banks 2 and 3, which do not have this obligation. This increase can be attributed not only to the introduction of the directive but also to the expanding trend of corporate social responsibility in the world.

**Environmental information** is reported by at least a group of banks 1 compared to other information examined and other non-financial reporting areas examined. In contrast, the banks without the obligation to make one of the most reported areas, even in group 2 banks saw the highest increase of all groups, it was an increase of almost 28 per cent points. There was a large increase in group 1 of banks, this increase was not as significant as in group 2. In the **Social area**, there was an increase only in the group of banks 1 and 2, by about 10 percentage points. There was no increase in the percentage of reporting for other financial institutions. In the **area of employee care**, there was an increase in reporting for all monitored groups of banks. The largest increase in reporting occurred in the group of banks 1, by almost 15 percentage points. Non-financial information also includes reporting on **Respect for human rights**. This area is most frequently reported for Group 1, where almost half of the entities in the Bank 1 group reported it before the entry into force of this Directive. This group also saw the largest increase. In our opinion, the **area of corruption, bribery and money laundering** is one of the most important areas for banking institutions. It was also not surprising to find that this group of banks 1 is the most frequently reported. Within 3 years, there

was an increase in reported by 25 percentage points. Conversely, for banks without an obligation to report non-financial information, this area is one of the least published.

Table 2 compares the reporting of non-financial information in the Czech Republic with the reporting in other V4 countries and in France and Germany. The V4 countries were chosen because of a similar historical context and the same date of accession to the EU. Germany was chosen as the most important economic partner of the Czech Republic due to the significant share of foreign trade in GDP. France was the first EU country to introduce the obligation to report non-financial information.

*Table 2 Comparison with selected EU countries*

<b>States</b>	<b>The environment</b>	<b>Empolyees</b>	<b>Respect of human rights</b>	<b>Fight against corruption and bribery</b>
The Czech republic	26,67 %	100,00%	40,00 %	90,00 %
Hungary	8,33 %	50,00 %	50,00 %	75,00 %
Poland	16,67 %	100,00%	50,00 %	75,00 %
Slovakai	27,80 %	50,00 %	33,30 %	58,35 %
Avegare of V4	19,87 %	75,00 %	43,33 %	74,59 %
Germany	50,00 %	91,70 %	75,00 %	68,30 %
France	57,80 %	100,00%	80,00 %	80,00 %

It is obvious that in most criteria the Czech Republic exceeds the average of the V4 countries, even in the area of the fight against corruption it even exceeds Western Europe. In the area of employee care, all banks in the Czech Republic and Poland report this information similarly, which is the same result as in France, and even more so than in Germany.

On the contrary, the Czech Republic shows worse results in comparison with Western Europe in the areas of human rights and the environment. These areas are comparable in reporting to other V4 countries. The area of human rights is the only area where we lag behind not only Western Europe, but also the average of the V4 countries.

## Conclusion

The research shows that after implementation, there was an increase in reporting in addition to the group of banks with the obligation to report non-financial information arising from the EU directive, also for banks that do not have this obligation. The increase in reporting at banks with obligations was therefore caused not only by the implementation of the directive into Czech accounting legislation, but also by the expanding trend of social responsibility. The second part of the research shows that the Czech Republic reports non-financial information to a greater extent compared to other V4 countries. On the contrary, the Czech Republic lags behind in comparison with Germany and France. The growing rate of reporting non-financial information in the Czech Republic by banks may therefore also be inspired by banks operating in Western European countries.

In addition to the annual reports, entities required to disclose non-financial information usually had separate sustainability reports for 2019, which focused only on the bank's non-financial information and where most of the criteria we examined were mostly described. It should be noted that the amount and detail of the information provided varied from bank to bank. Some banks (in most cases those with an obligation to disclose non-financial information) had prepared very detailed reports with non-financial data supplemented by graphs, tables and other statistical data, and other banks published non-financial information to a very limited extent.

In the future, it can be assumed that the rate of reporting of non-financial information by banks will continue to increase. The reason is the fact that banks in the Czech Republic have committed themselves to gradually reduce their carbon footprint. They are making an increasing effort to report a certain part of so-called green assets in their assets. Specifically, these are loans provided to companies that approach the environment, climate change, etc. Banks are realizing that they need to take a comprehensive approach to these areas. Therefore, as a result, they will reflect in the price of loans the access of clients to these areas within their business. And they can use a simple tool to measure the impact of these measures, which is the level of interest.

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# Sustainable Development and its Challenges in the Context of Global Economy

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**Abstract:** The environment has been ravaged and overexploited by human beings almost from the dawn of civilization. However, no sooner that in the course of the industrial revolution did the extensive exploitation of the Earth's resources, combined with the destruction of nature on a really great scale being a side-effect of economic activities, commence.

Along with the globalization process, and the spread of the business philosophy of "profit at any cost", the situation was becoming ever more serious. This as well as many ecological disasters caused by human activity made mankind aware of the "shape of dangers to come" and the need to counteract the degradation of the environment, which gave rise to various environment protection concepts. Among them, "sustainable development", offering a well-balanced approach to the relationship between mankind and the environment, plays an essential role.

Sustainable development, which, meanwhile, has become a sui generis universal doctrine, is based upon three main pillars: social inclusion, economic growth and environment protection. According to the majority of public opinion, it is an adequate response to many contemporary challenges. However, it is not easy to implement its goals nowadays as there are many challenges, most of which are connected with the effects of catastrophes connected with climate changes, the scarcity of resources, soil and air contamination, social inequalities, political tensions, at times leading to wars, or business' selfish attitudes and nationalistic "sacro egoismo".

To be effective, sustainable development must cover several key areas of mankind activity such as education, economy or health care. Decision-makers like entrepreneurs and managers can play an important role in this endeavour.

The purpose of this article is to holistically present the possibilities of implementing sustainable development concept in the context of relevant previous experiences and the current threats. This article fills the existing gap in research evidenced by the content of the literature of the subject.

**Methodology approach:** The specificity of this research rendered it necessary to use the documentary research method and historical research method.

**Social implications:** In the area of application, this article presents the conclusions resulting from it having become possible to sustainable development concept as well as possible difficulties in this respect. In this context, the role of human consciousness in finding the best solutions to the difficulties faced by all the stakeholders of implementing sustainable development concept was emphasized.

**Key words:** sustainable development, production, environment resources, globalization

## Introduction

The economic activity of our species led to civilization development. Unfortunately, this process has been connected with such negative phenomena as growing social

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inequalities, the development and use of new weapons or poisoning the environment, the latter of which was long ignored despite a strong evidence of a link between the destructive activity of mankind and the climate change, associated with increasing number of natural disasters claiming the lives of people and animals and causing destruction sometimes to a degree which causes the waves of the so-called "climate emigration". The climate change is also associated with military conflicts over various types of resources, including water, an example of which may be the tensions between Egypt and Ethiopia over the use of the Nile's water resources.

This state of affairs is forcing mankind to choose between continuing overexploitation and making profits at the expense of ever diminishing Earth's resources or radically changing the way of life, and adopting the idea sustainable development, which is not exactly a novelty because many advocated for a good treatment of the environment in the past; yet, these views frequently ignored. The contemporary situation is forcing to choose one of the two options mentioned above. In the context of huge ecological threats, this decision is connected with the question of the survival of mankind.

### **Literature Review / Research Background**

The issues discussed in this article has yet to be described holistically (Singer 2017, pp. 216-255), and sustainable development is dominated by the tendency to adopt approaches which are rather atomistic than holistic, and which focus on relatively specific topics (Mambretti, Miralles i Garcia 2020). As a result, there are plenty of treatises and papers on detailed issues in the scientific literature, and very few generalizations that are valuable in terms of research. This is due to significant methodological differences rendering it impossible to arrive at conclusions that could not be reasonably questioned. There are many books on ecology, and also publications about the influence of ideology on the various types of mankind activity in the area of environment protection, but none publications satisfyingly presenting the challenges to sustainable development concept in the context of global economy (Cavanagh, Mander 2004, pp. 86-198).

An important role is played by the polemical literature, representing the attitudes of individual ideological directions to the subject of ecology (Steger 2009, pp. 94-95); it is worth indicating the currently published works of politicians-scientists on these issues, whose authors are seen, e.g. in the ranks of the green movement (Esguerra, Helmerich, Risse 2017, pp. 58-113). Interesting works include ideological texts, showing ambitions to give direction to the discussion about the essence of ecology and its impact on the existence of mankind, an example of which can be so-called "deep ecology"(Lalenti 2020, pp. 13-188). Significant new impulses come from philosophical and ethical works, showing the moral aspects of this issue (Singer 2004, pp. 1-195). Valuable works are also created on the "periphery" of ecological topics, e.g. in the pedagogical context (Zielinski 2014,

pp. 393-412). However, there are no texts presenting the processual character of creating sustainable development concept in the historical perspective in relation to the relevant challenges. This article tries to fill the existing gap in research evidenced by the content of the literature of the subject.

## Methodology

The methodological aim of this article is to use the research techniques that allow the analysis of sustainable development issue in the processual context. (Dekking, Kraaikamp, Lopuhaä, Meester 2010, pp. 135-327) The specificity of this research field rendered it necessary to use several complementary methods (Kumar 2014, pp. 256-330), among others and apart from "standard techniques", like the documentary research method and the analysis of media content (Neuendorf 2002, p. 52), also the comparative historical research method (Weber 2009, pp. 81-167).

## Results

Small problems with environment-unfriendly human behaviour occurred already at the hunter-gatherer stage when the growth of a *homo sapiens* population in a particular area resulted in the local extinction of plant and animal species.

As a rule, the consequences were not very serious because a human community which depleted natural riches too much in one area, solved this problem simply by migrating farther. (Livi-Bacci 2012, pp. 1-124)

The situation became far more complex after the first larger and more organized structures, called "river civilizations" (like in Mesopotamia), entered the stage. The people living there were dependent on the environment, and possible anomalies, including those which these very people were to blame for, might well threaten their lives and the existence of their whole states. The main "sin against the nature" was polluting soil and water by metallurgy, seen already during the Middle Ages. Among other, older (related to ancient times) examples of the extinction of some species, like the lion in North Africa, being the result of catching these animals for arena fights by the Romans, can be mentioned.

The cultures of Central and South America, in which metalworking techniques did not develop, also experienced environmental problems due to overpopulation and poor water management. (Murray 2017, pp. 167-177) It is also possible that the collapse of the irrigation system of Angkor Wat (in Cambodia), being one of the a major ecological disasters of the Middle Ages, was caused by similar events (Elias 2017, pp. 195-239).

A certain increase in the destruction of the environment in Europe is associated with a seventeenth-century economic concept, namely mercantilism. At that time, manufactories were established in such colonial powers as France or England and a great demand for raw materials to produce goods and means of transport was

observed, which was mainly relevant to timber for building ships and houses in developing cities. Therefore, it was probably not a coincidence that the first person to have ever used the term "sustainable development", namely German Hans Carl von Carlowitz (1645-1714), was a forest resource manager; he coined this new term no later than in 1713. Carlowitz's concept assumed running a "rationally-oriented" economy, and there is nothing surprising in the fact that his ideas have been drawn upon by thinkers concerned about the bad state of the environment in the second half of the twentieth century.

The problems with the destruction of the environment by human behaviour arose on a massive scale at the end of the 18<sup>th</sup> century, and that because of the "industrial revolution", which is understood as a dynamic process of scientific, economic and social changes initiated by patenting the improvement in the steam engine by the Scottish engineer James Watt in 1769. As it was observed, this period was extremely important for the history of mankind and, to a large extent, shaped the modern civilization. Unfortunately, there were also serious 'dark sides' of it, and one of them was the pollution of the environment on a huge scale.

The economic boom that followed the World War II exacerbated the ecological problems of our planet as it was the armed forces and the defence industries that contributed to polluting the environment. Signs of an impending disaster began to appear. In this situation, the discussion on the limits of economic development gained a lot of momentum, and its subject was taken up by the Club of Rome, an international think tank, established in 1968 and dealing with global problems in the context of the environment. As a result of its work, a document entitled "Limits to Growth" was prepared and published by the Volkswagen Foundation in 1972. The conclusions contained therein that development "without limits" is not possible, and overexploitation takes place at the expense of future generation (Johnson, Turner 2016, pp. 263-267).

The thoughts contained in the document of the Club of Rome generated considerable resonance in various circles. The resulting "ferment" led to attempts to remedy the negative state of affairs, and the most significant of them was the report of the World Commission on Environment and Development, chaired by the Social Democratic Prime Minister of Norway, Gro Harlem Brundtland, which was published in 1987. This commission was established at the request of the General Assembly of the United Nations. In the final document of the Commission's work, sustainable development concept as a reasonable combination of economic activity with respect to the environment was formulated. As a result of this, it was believed that future generations should inherit the world in a "good shape" (Steger 2009, pp. 22-25).

Analysing the causes of the progressive degradation of the environment, the Gro Harlem Brundtland Commission criticized the overexploitation of the Earth's natural resources by the so-called Western developed countries (Trafialek, 2010, pp. 304-318). At the same time, it was indicated that the Third World was trying to imitate

both the Western way of economic activity and its way of life, which led to an additional burden on the ecological system of our planet (Marshall 2016, pp. 43-61). In order to improve the state of the environment, it would be necessary to seek international solutions and work out a general system of economic activity, taking into account the interests of less developed countries in the context of implementing "sustainable development" concept (Gilbert 2012, p. 19).

The present period of time seems to be favourable for activities aimed at improving ecological condition of the world according to the principles of sustainable development. It seems to be easier to mutually connect the different segments of the world economy, and owing to that fact undertaking pro-ecological initiatives in one sector is likely to cause similar phenomena in other parts of the global economy. Regardless of this, sustainable development faces many challenges hindering its implementation.

The most serious of those include the philosophy of maximizing profits 'at all costs', typical for *laissez-faire* capitalism and connected with the belief nothing matters more than continuous economic growth, which natural resources should serve.

A very serious challenge to sustainable development is poverty and large social differences prevailing in many parts of the world. Food shortage, clean water or housing makes people affected by these plights focus primarily on survival, while usually neglecting environmental problems. Ecological issues are not regarded as very important by the governments of poor countries either (Stiglitz 2016, pp. 284-242).

The development of so-called "green technologies" and their implementation in the industrial sector changes the structure of world's economies, and poses a significant problem for a large number of small and medium-sized companies, often dependent on larger economic entities. Organizations of this type are usually unable to develop innovative technologies or implement them effectively. This problem, as a rule, does not affect large companies having adequate dedicated funds, but it not so in the case of small and medium-sized enterprises. The same applies to transport, which is currently one of the largest sources of pollution of the environment. It is much easier to demonstrate innovation in the implementation of sustainable development concept for large companies, supported by local governments, as it is proved by, among others, the example of Hamburg-Holstein transport company (Verkehrsbetriebe Hamburg-Holstein) in Germany than smaller companies, which have to rely mainly on their own resources in terms of ecological activities.

Dangers to the implementation of sustainable development concept are related to the unclear forms of the operation of "great economic players", namely transnational corporations, whose financial potential often exceeds those of individual national economies. These above-mentioned business organizations largely set the direction for the world economy, and are able to effectively torpedo "ecological orientation" in their sphere of influence. In this respect, they could

count on the solidarity of the conservative parts of the bureaucratic apparatuses in many countries, which seem to be reluctant to any changes considered to be too rapid and revolutionary (Piketty 2014, pp. 237-467).

Serious challenges are related to political area; the fact that there are so many antagonisms between states or groups of states, sometimes reaching the level of armed conflicts, is not conducive to harmonious cooperation in the implementation of sustainable development concept. Although there is a certain rapprochement in this area, related to the experiences of "common interests" in the scope of halting the environmental disaster and avoiding the negative effects of the climate change, there is still so much uncertainty and mutual aversion among them. In this context, there are serious differences of interests between countries with certain types of economies, which, obviously, affect their activities in the field of nature conservation, should also be mentioned; an example may be the fact that countries with large oil resources strive to the use of energy from renewable sources. They are in natural opposition to these countries which do not have such resources and which are more interested in introducing solutions based upon energy from renewable sources.

Serious threats are related to nationalist sentiments, manifested, among others, by reluctance to take action in order to protect the environment when other countries fail to do so, be it really or allegedly. It is not surprising that such an attitude opens the "Pandora's box" of mutual accusations, and renders it impossible to undertake act for the benefit of the whole world. Practice shows that this practice is willingly resorted to by demagogues and autocrats.

A serious problem is created by the tendency to subsidize, in a more or less hidden way, certain types of energy or technological solutions harmful to nature and the use of "deceptive calculation systems", which fail to take into account the real losses associated with the removal of damage after specific practices within the scope of production or service. In this context, attention should be paid to the risks associated with pseudo-green activities, which do not actually help to protect the environment. A good example can be nuclear energy, praised by its supporters as the "best solution to the energy crisis", apparently not realizing, or refusing to admit, that its "greenness" is simply a fake. Numerous accidents at nuclear power plants and the problems with the storage of radioactive waste from them, with a half-life period of many thousand years, can illustrate this state of affairs well (Adams, Anderson 2019, pp. 11-140).

In the field of agriculture, large food production corporations pollute the environment to a much greater extent than small farms. In many countries, such as Brazil, agricultural companies corrupt the authorities, and achieve profits at the expense of the environment.

There are also controversial projects such as the agricultural large-scale cultivation of plants (e.g. soybeans) used to produce fuel oils instead of food that deserve mentioning in this context. There can be serious doubts as to whether such

projects will be good for the protection of the environment, considering the fact that the huge plantations of this kind threaten the existence of hundreds of thousands of farmers, and, simultaneously, consume enormous amounts of costly water.

Another serious challenge to sustainable development is greenwashing, which shows a phenomenal ability to adopt itself to new situations in order to deceive customers and "make money". This practice is difficult to combat, and it seems that as long as it finds a sufficient number of ignorant victims, it will not be abandoned or eradicated.

Sustainable development concept is faced also with the "basic existential challenge", and that means the shrinking resources of our planet along with the continuous growth in the Earth's population. It resulted in the necessity to change the people's way of life, in particular, to resign from practices that rob our planet of wealth and destroy the environment.

## Discussion

In the past, the attitude based upon sustainable development was often contrasted with a free market economy concept. This way, some of the public arrived as an opposite conjunctions, an antagonistic image was created: on the one hand, the activities of an economic nature, with an evident pursuit of profit, even at the expense of nature, and, on the other, pro-ecological activities, limiting the effectiveness of economic activity. (Hannerz 2010, pp. 13-102) Regardless of this, some big economic players tend to pose as "role models" in terms of "ecological cleanliness" in developed countries, while, at the same time, moving their manufactories based upon dirty technologies to developing countries (Cavanagh, Mander 2004, pp. 86-88) In this context, the well-known greenwashing phenomenon, based upon apparently pro-ecological activities, which, *de facto*, lead to gaining profits using a kind of spin techniques, seems debatable.

Another tendency that complicates the public discussion on ecology is its perception by some decision-makers mainly in the context of its economic components and in isolation from the social awareness indispensable if sustainable development is to receive supported by society it needs to be successful (Singer 2016, pp. 287-293).

The destruction of the environment forces us to take a rapid action, yet, as previously mentioned, not everyone shares this view. The opponents are not a homogeneous group, nor and their actions are not always driven solely by greed or opportunism. There are a large number of economic entities which, due to their behavior, may be defined as the "opponents" of the concept of sustainable development concept, although in the ideological sense they are not. These are mainly small and medium-sized firms that cannot afford to develop and implement expensive technological innovations to improve the condition of the environment. Considering the current economic structure of the world, it should be stated that this

issue concerns a significant part of the economic organizations of our globe. (Acemoglu, Robinson 2013, pp. 70-95) Simultaneously, it is necessary to indicate the social differentiation in the context of the north-south division, which, to a large extent, still remains relevant. It seems that the lack of support for poorer economic sectors in the world may be one of the most important challenges for the implementation of sustainable development concept in general. It is closely related to the issue of education, especially, for the poorer part of the world population; not only does the lack of adequate efforts in this regard deprive huge numbers of young people of access to development opportunities, but also makes them undertake various forms of activity that harm the environment. The existing problems force the supporters of sustainable development to fight to achieve their goals. On the one hand, they have to deal with environments hostile toward them, but on the other, raising ecological awareness also means increasing support for them. Despite the existing difficulties, the chances of victory in the implementation of sustainable development concept are not small.

### **Conclusion**

It took sustainable development concept a long time to take shape and gain supporters. Despite many efforts by its advocates, it did not succeed as, for a long time, it failed to obtain the necessary "implementation power". Finally, it began to take shape in the form of particular political decision reflected in specific documents as well as a broad movement for sustainable development. There are also discernible signs of a "green technological revolution" as manifested in the development of increasingly efficient renewable energy sources. Despite the difficulties, for the first time in the human history, there is a real possibility to take opportunity for collective action for sustainable development. To be effective, such an action must be collective, planned for a long time, and based upon a change in the way of thinking and living from "wasteful and selfish" to rational and dedicated to the common good of mankind. In shaping such attitudes, efficient scientific and educational institutions as well as strong cultural and opinion-forming centres are necessary (Akerlof, Shiller 2009, pp.19-25) Not only can they help create a positive social climate for the implementation of sustainable development, but also make more people understand that the actual battlefield between those caring about the environment and those disregarding its state. In the light of the above considerations, it seems to be possible. In this context, it is worth realizing the meaning of the words spoken many years ago by Mahatma Gandhi "What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another", and also "What we do today, is our future."

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# TEN CENTS DO NOT BUY A MEAL – WHY RETAILERS SHOULD NOT LIMIT DONATIONS OF THEIR CUSTOMERS

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**Abstract:** Rounding up the shopping bill in retail stores is usually restricted to a certain amount, such as a maximum of ten cents. Since customers do not all exhibit the same willingness-to-pay (WTP), some of them would obviously contribute more if they had the possibility, so the arbitrary limitation does not fully utilize the total sum that could be collected if customers were able to choose the size of their donations.

This paper aims to examine whether a free choice for customers to which amount they could round up their shopping bill does result in higher intended donations than various fixed limits or than a selection out of five options. Data collection has been conducted through an online survey of adult customers of German food retail stores. Subsequently, t-tests for dependent samples and analyses of variance (ANOVA) have been employed.

The study reveals that a free choice leads to a significant increase in the sum of customer donations to more than six and a half times, compared to rounding up to the next ten cents. Moreover, the framing of prompting for a contribution has a considerable impact on the willingness-to-donate of customers as well: If specified as a percentage of the shopping bill, donations are significantly larger than if they are stated in terms of an absolute amount or as a share included in the total payment.

The scenarios investigated in this paper constitute a more flexible way of rounding up the shopping bill and therefore are a highly effective means to support a good cause and care for society, e.g. by reducing poverty. Hence, they prove to be an eligible Cause-related Marketing (CrM) concept for food retail companies in the context of their Corporate Social Responsibility (CSR). However, results refer to intended donations, so in reality amounts might be lower due to an attitude-behaviour gap. Additional research in this area is suggested regarding other retail formats, online shopping, and other countries, as well as involving settings with actual donations.

**Key words:** cause-related marketing, corporate social responsibility, retail, rounding up, willingness-to-pay

## Introduction

Typically, in Cause-related Marketing (CrM) campaigns customers cannot influence the size of their donation to a good cause – which is set by the company and is linked to the purchase of a product or a service. In addition, these contributions often are rather small and thus only represent a small share of the sales price. Likewise, rounding up the shopping bill in retail stores – also referred to as checkout charity – is usually restricted to a certain amount, such as a maximum of ten cents. Since customers do not all exhibit the same willingness-to-pay (WTP – or willingness-to-donate, respectively), some of them would obviously contribute more if they had the possibility for this, so the arbitrary limitation does not fully utilize the total sum that could be collected if customers were able to define the size of their donations, for example like when they are giving a gratuity in a restaurant.

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Collecting customer donations can both serve to improve customers' perception of a retail company's social responsibility – a topic that has constantly risen in consumers' awareness – and to support a good cause and thus care for society which is an important issue since still hundreds of million people live in extreme poverty. Not only governments – with several having pledged (and some also achieved) to allocate 0.7 percent of their gross national income (GDI) to official development aid (ODA) – but also individuals and companies bear a moral obligation to end poverty. Especially the (food) retail sector with a huge sales volume and a vast number of customer contacts each day is very well qualified to involve buyers to donate small amounts which is already practiced in some but by far not in all retail stores.

This paper aims to examine whether a free choice for customers to which amount they could round up their shopping bill at German food retail stores does result in higher intended donations than various fixed limits or than a selection out of five options, provided they consider the good cause worth to be supported. Of course, this concept would be applicable to companies in other countries with different currencies as well.

By looking at food retail customers' WTP related to donations, and by focussing on a free choice instead of fixed amounts, the study extends the existing research in this area and generates valuable insights for retail companies to enhance their CrM campaigns and hence both benefit economically as well as increase their impact in doing good.

## **Literature review / Research Background**

Cause-related Marketing (CrM) activities, which are one method of companies' Corporate Social Responsibility (CSR) efforts (Kotler, Lee 2004), have been implemented in different industries over the past decades. The beginnings of CrM are often dated back to the 1980s, when the credit card company American Express provided a donation for each card transaction for restoration of the Statue of Liberty (Natarajan et al. 2016). Meanwhile, in 2019 the volume of CrM campaigns has reached more than \$ 2.23 billion in the United States (IEG 2019).

According to a widely-used definition by Anil Menon and P. Rajan Varadarajan, CrM links donations with a revenue-generating transaction, such as the purchase of a product or a service, and is described as *“the process of formulating and implementing marketing activities that are characterised by an offer from the firm to contribute a specified amount to a designated cause when customers engaging in revenue-providing exchanges that satisfy organisational and individual objectives”* (Varadarajan, Menon 1988, p. 60). Typically, for each unit sold a certain share of its sales price is transferred to a partnering charity. This share has been often stated as a percentage of the sales price, but a specification in terms of an absolute amount has become more common (Chang 2008). Another option would be to name a precise outcome (e.g. one tree planted, or one school meal supported).

CrM campaigns can result in a win-win-win outcome for all parties involved (Hawkins 2012): First, obviously for the charitable organization that receives the financial means and possibly also gains public awareness due to the marketing

activities of the company (Youn, Kim 2008; Hawkins 2012). Second, for the company since it is perceived as acting socially responsible (Gupta, Pirsch 2006) as well as through increased customer satisfaction and customer loyalty (Sen, Bhattacharya 2001; Hamby 2016). Finally, for customers who may gain increased utility through doing good (Strahilevitz, Myers 1998), for example by feeling a warm glow (Kahneman, Knetsch 1992; Heidarian 2019) due to impure altruism (Andreoni 1989; Crumpler, Grossman 2008).

Numerous studies have been conducted to investigate the parameters that are crucial for successful CrM implementations. These include the type of the product (Strahilevitz, Myers 1998; Strahilevitz 1999; Chang 2011), the type of the cause to be supported (Lafferty, Edmondson 2014; Sabri 2018), the company-cause-fit (Lichtenstein et al. 2004; Pracejus, Olsen 2004; Simmons, Becker-Olsen 2006), the donation amounts (Koschate-Fischer et al. 2012), the time horizon of the CrM campaign (Thomas et al. 2011), or the differences between campaigns in various countries (La Ferle et al. 2013; Choi et al. 2016).

In addition, it has been shown that providing customers a choice of which good cause to support, instead of limiting it to only one, has a positive impact (Botti, McGill 2006; Robinson et al. 2012; Kull, Heath 2016), although too many choices could lead to an overload of subjects (Iyengar, Lepper 2000). Another way of offering a choice for customers applies to the amount to be donated, which could utilize consumers' willingness-to-pay (Krishna 1991; Koschate-Fischer et al. 2012) – or willingness-to-donate, for that matter.

As a special form of CrM, offering customers to round up their shopping bill amount – also referred to as checkout charity (Giebelhausen et al. 2017) – is especially suitable for retail companies (Kelting et al. 2019). In this scenario, with a free choice of the donation size (rather than one fixed amount), customers could choose their preferred donation – very similar to giving a gratuity in a restaurant. In contrast to a donation for a single product which is usually fixed and defined by the manufacturer, flexible rounding up could easily be implemented by retail companies and enables those customers who want to donate more than the few cents while rounding up to a fixed amount, to do so. Compared to traditional CrM campaigns in which customers do not have a choice at all regarding the donation (if they buy the product or service, then exactly the amount set by the company will be donated) and rounding up to a fixed amount where customers have only a limited choice (they can only either round up or not, but not decide how much will be donated), flexible rounding up provides customers the largest extent of a choice (not only whether to donate or not, but also concerning the size of their donation).

Usually, companies determine the selling prices for their products or services. This task could be rather difficult, as the optimum price depends on several factors like internal cost accounting, competitors, demand, and customers' willingness-to-pay which is the maximum price an individual is accepting to pay and depends on certain intrinsic as well as extrinsic factors. In contrast, without necessarily being linked to donations, consumer elective pricing strategies recently have emerged and gained attention in literature (Chandran, Morwitz 2005; Kim et al. 2009; Regner, Barria 2009). Two different options of these customer-driven pricing mechanisms

that provide consumers some pricing power are name-your-own-price (NYOP) with a minimum price – which the customers do not know – and pay-what-you-want (PWYW) without any threshold value, so the sales price could be as low as zero in this scenario (Kim et al. 2009). In case the product or service is familiar to consumers (e.g. buying fruits or vegetables), it should not be too difficult to decide how much to pay, but otherwise a suggested price may serve as a reference and offer some guidance. It has been shown that these participative pricing strategies could lead to higher preferences by customers and to greater purchase intentions (Chandran, Morwitz 2005). However, obviously participative pricing strategies tend to be not very suitable in supermarkets or other food retail stores where customers typically buy up to several dozens of articles with one purchase.

PWYW scenarios may also include the donation of a part of the sales price, and therefore – according to the term CSR – can be regarded as shared social responsibility (SSR) between the customer and the company (Gneezy et al. 2010). Research on PWYW in conjunction with donations comprises transactions with commodities such as souvenir photos in a theme park (Gneezy et al. 2010) or on a tour boat (Gneezy et al. 2012), food in a restaurant (Gneezy et al. 2012), beverages in a coffee shop (Park et al. 2017), or doughnuts and re-usable shopping bags (Jung et al. 2017), and it indicates that scenarios with donations can result in higher profits.

Like NYOP or PWYW, where customers pay as much as the purchase is worth to them, flexible rounding the sopping bill amount up enables customers to pay as much as the purchase including a donation is worth to them, with a minimum price that they are aware of (i.e. the shopping bill amount without the donation). Therefore, flexible rounding up could also be classified as a participative pricing strategy. Since the price to be paid for the purchase is determined by the retailer and customers on top can donate any amount they want – including zero – this strategy will be named donate-what-you-want (DWYW). Like a reference price for a PWYW strategy, the retailer could also suggest a donation amount for customers. Previous research (Horn 2020) indicates that in some cases providing customers a reference regarding the size of their donation leads to higher amounts which are donated.

## Methodology

With reference to research question (RQ1) “Does facilitating voluntary variable donations result in a reasonable sum of donations in relation to the overall shopping cart volume, especially compared to the rather low donations generated through other forms of CrM campaigns with fixed donation amounts?”, and based on previous findings related to donation size (Krishna 1991; Koschate-Fischer et al. 2012) as well as on the fact that customers’ WTP differs individually, it can be assumed that offering a free choice will increase customers’ donations, so hypothesis (H1) is proposed as follows: “If a food retail company offers its customers to choose the individual size of their voluntary donations, then the collected sum will be larger than for customers’ voluntary donations with only one fixed amount.”

A survey of adult customers of German food retail stores has been conducted in 2019 via a structured online questionnaire in SoSciSurvey to collect quantitative

primary data. Besides inquiring for demographic data, four questions assess the donation behaviour in different scenarios. For each question, six different shopping bill amounts between 0.79 euro and 35.60 euro have been presented to all respondents with the purpose of representing various shopping baskets. For each complete data record with answers for all shopping bill amounts, the arithmetic mean of the six donations (or zero, in case customers do not wish to donate) has been calculated and – for the purpose of easier comparison – converted into a percentage of the average shopping bill amount.

In the first question, participants have been asked for each shopping bill amount to state whether they would like to round up their payment to the next ten cents and donate this difference to a charitable organization which they consider worth to be supported when shopping at a food retail store that they typically visit. In the second question the same six shopping bill amounts have been presented to the respondents and they have been asked whether they would round up their payment to the next euro. In the third question, in a between-subject design, respondents have been randomly assigned to one of three groups with different framings of asking them to donate. Subsequently, participants have been requested to select one out of five options for different donation sizes (or not to donate): In group a, the donations have been stated as an amount (in euro) on top of the shopping bill amount; in group b as a percentage of the shopping bill amount; and in group c as part of the total payment (in euro) including the shopping bill amount. In the fourth question, with the same three groups as before, participants have been offered a free choice to determine the size of their intended donations, or not to donate.

A total of 677 respondents completed the questionnaire. 56 of these answers have been discarded due to several reasons, such as very short response times (faster than half of the median for the whole survey), as no consent was given to use the answers, or because the age was below 18 years. Data of the remaining 621 records has been analysed in IBM SPSS Statistics.

71.5 % (n = 444) of respondents are female, 27.5 % (n = 171) male, and 0.6 % (n = 4) diverse. 80.4 % (n = 499) belong to the age group from 18 to 29 years, 14.8 % (n = 92) to the age group from 30 to 44 years, 4.2 % (n = 26) to the age group between 45 and 59 years, and 0.6 % (n = 4) to the age group above 60 years. Most respondents possess a university degree (62.8 %, n = 390) or a college degree (27.4 %, n = 170). Household sizes range between one person (23.7 %, n = 147), two persons (32.5 %, n = 202), three persons (16.7 %, n = 104), and four or more persons (13.6 %, n = 84). Monthly household income is distributed as follows: 23.3 % (n = 145) with 999 euro or below, 18.5 % (n = 115) between 1,000 and 1,999 euro, 16.3 % (n = 101) between 2,000 and 2,999 euro, 8.9 % (n = 55) between 3,000 and 3,999 euro, 7.6 % (n = 47) between 4,000 and 4,999 euro, and 10.0 % (n = 62) with 5,000 euro or above. 14.1 % (n = 87) of subjects live in communities with 9,999 or less inhabitants, 21.4 % (n = 133) in communities between 10,000 and 99,999 inhabitants, and 58.3 % (n = 362) in communities with 100,000 or more inhabitants.

A t-test for dependent samples has been conducted to check whether the difference between donations when rounding up to the next ten cents (base case) compared to donations with a free choice proves to be statistically significant, and

thus to confirm or reject the hypothesis. Further t-tests have been executed for each of the three framing groups. Additionally, analyses of variance (ANOVA) have been performed to assess the differences between the groups for questions 3 and 4.

## Results and Discussion

Box plots have been utilized to visualize the distribution of the values for the donations. 9 and 22 outliers (with donations which are larger than  $0.75 \times \text{median} + 3 \times \text{interquartile range}$ ) have been excluded for questions 3 and 4, respectively. Consequently, the highest donations equal 0.40, 3.86, 9.62, and 10.85 percent of the shopping bill amount for questions 1 to 4.

### Rounding up to a fixed amount

First, we look at two different ways of rounding up to a fixed amount: To the next ten cents (as practiced in several retail stores) and, alternatively, to the next euro (with donations up to ten times as high but probably less customers who donate). When rounding up to the next ten cents, 94.9 % of customers donate an average of 0.31 % of their shopping bill amounts, resulting in an aggregated average of 0.30 % for all customers (including those who do not donate). When rounding up to the next euro, 92.9 % of customers donate an average of 1.28 % of their shopping bill amounts, resulting in an aggregated average of 1.19 % for all customers (including those who do not donate), which is almost four times as much as when rounding up to the next ten cents.

### Five options

92.9 % of customers donate an average of 1.98 % of their shopping bill amounts, resulting in an aggregated average of 1.84 % for all customers (including those who do not donate), which is about six times as much as when rounding up to the next ten cents and about 55 percent higher than when rounding up to the next euro. Among the three groups, average overall donations range from 1.33 % to 2.15 %: Group b (asking for a percentage of the shopping bill amount) has the highest donations of 2.15 % despite of the lowest ratio of customers who donate (87.0 %), followed by group a (asking for an amount in euro on top of the shopping bill amount) with 2.02 % donations and the highest ratio of donating customers (96.9 %), and group c (asking for the total payment including the shopping bill amount) with 1.33 % donations and 94.7 % of customers who donate.

An ANOVA proves that the differences between the three groups are significant ( $F(2, 563) = 10.969$ ,  $p < 0.001$ , partial  $\eta^2 = 0.038$ , adjusted  $R_{squared} = 0.034$ ,  $n = 566$ ). According to Jacob Cohen, the effect size ( $f = 0.20$ ) can be considered as small to medium (Cohen 1988). Bonferroni-adjusted post hoc tests show that all three types of framing differ significantly: Stated as a euro amount ( $M_{euro} = 2.02$ ,  $SD_{euro} = 2.00$ ), stated as a percentage ( $M_{percentage} = 2.15$ ,  $SD_{percentage} = 2.11$ ), and included in the total payment ( $M_{payment} = 1.33$ ,  $SD_{payment} = 1.24$ ).

### Free choice

94.2 % of customers donate an average of 2.12 % of their shopping bill amounts, resulting in an aggregated average of 1.99 % for all customers (including those who do not donate), which is about six and a half times as much as when rounding up to the next ten cents and about 67 percent higher than when rounding up to the next euro. Among the three groups, average overall donations range from 1.37 % to 2.67 %: Group b (asking for a percentage of the shopping bill amount) has the highest donations of 2.67 % despite of the lowest ratio of customers who donate (89.9 %), followed by group a (asking for an amount in euro on top of the shopping bill amount) with 2.00 % donations and the highest ratio of donating customers (97.2 %), and group c (asking for the total payment including the shopping bill amount) with 1.37 % donations and 95.1 % of customers who donate.

An ANOVA proves that the differences between the three groups are significant ( $F(2, 530) = 18.142$ ,  $p < 0.001$ , partial  $\eta^2 = 0.064$ , adjusted  $R_{squared} = 0.061$ ,  $n = 533$ ). According to Jacob Cohen, the effect size ( $f = 0.26$ ) can be considered as medium (Cohen 1988). Bonferroni-adjusted post hoc tests show that all three types of framing differ significantly: Donations stated as a euro amount ( $M_{euro} = 2.00$ ,  $SD_{euro} = 2.02$ ), donations stated as a percentage ( $M_{percentage} = 2.67$ ,  $SD_{percentage} = 2.55$ ), and donations included in the total payment ( $M_{payment} = 1.37$ ,  $SD_{payment} = 1.34$ ).

### The impact of a free choice on customers' donations

A paired sample t-test at a confidence interval of 0.95 indicates that a free choice significantly influences donations ( $t(464) = 18.111$ ,  $p < 0.001$ ,  $d = 0.840$ ) with a large effect size (Cohen 1988). Donations in a setting with a free choice ( $M_{free\_choice} = 2.06$ ,  $SD_{free\_choice} = 2.15$ ) are significantly higher than donations in a setting with rounding up to ten cents ( $M_{base} = 0.30$ ,  $SD_{base} = 0.12$ ), so the null hypothesis is rejected, and hypothesis (H1) can be confirmed. Hence, if the retailer offers a free choice, customers of German food retail stores donate significantly higher amounts than when rounding up to a fixed amount.

### Conclusion

This study reveals that offering customers a free choice proves to be a suitable approach for German food retailers to increase the donations of their customers: Individual donations of customers are substantially larger, so the total sum of donations significantly increases by more than six and a half times from 0.30 % of the shopping bill amount to 1.99 %.

Framing has a considerable impact on size of customers' donation as well: Stating the donation as a percentage of the shopping bill amount leads to the largest values (2.67 % of the shopping bill amount – almost nine times as much as when rounding up to the next ten cents). However, it might be hard for customers to calculate the size of their donations as a percentage, especially at the checkout of a food retailer, so this might induce confusion or even dissatisfaction. Moreover, this group shows the lowest share of customers who donate (89.9 %). Consequently, retailers should

better think about framing the donation as an absolute amount, although the total sum might be smaller (2.00 % of the shopping bill amount, with 97.2 % of customers who donate). This is in line with research which claims that information should be presented in a transparent and straightforward way (Olsen et al. 2003; Chang 2008).

Certain limitations which particularly apply to online surveys need to be considered, such as an attitude-behaviour gap (Carrington et al. 2010) or a sampling bias (Pecáková 2016): In some respects, answers noticeably differ from data of existing CrM campaigns for rounding up to the next ten cents in Germany. Hypermarket chain Kaufland, for example, with a sales volume of 15.4 billion euro in 2019 (Statista 2020) collected donations of about 300,000 euro during that period (Deutschland rundet auf 2020), which translates into merely 0.002 % of the shopping bill amount. Moreover, this survey assumes that customers assess the charity as worth to be supported, which obviously might not always be the case in practice. Furthermore, customers could forget to donate if the cashier does not ask for a donation or could not be aware that the possibility to donate exists at all. Because the sample consists mainly of women (71.5 %), young respondents below 30 years of age (80.4 %) and university graduates (62.8 %), it does not precisely represent the structure of the German population, which one should bear in mind when drawing conclusions.

To cope with the large size and variety of the retail industry, I recommend conducting future surveys regarding other retail formats (as they feature different sales prices and/or number of articles), and possibly also related to online shopping. Additionally, other tertiary sector industries such as hospitality, transportation, or financial services appear to be feasible for the concept of donate-what-you-want, too. Finally, research in other countries with either the same (i.e. euro) or other currencies could provide interesting insights related to differences in donation behaviour across various nations, cultures, and economic systems.

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## THE BUSINESS OF PARADOX: CLASSIC METHOD SUSTAINABLE

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**Abstract:**

**Purpose:** The basic paradox and research question in the beginning was the combination of luxury wine marketing of sparkling wines and sustainability. The main research objective is to define and evaluate the benefits of establishing and developing wine cluster for sustainable sparkling wine producers. Very important research objective is how to increase motivation to start new businesses providing sustainable development in the region.

**Design/methodology/approach:** The most of all the research and scientific resources were obtained with cooperation of Austrian Wine Producers Associations and specialised academic experts at the Universities in Austria. The wine industry in Austria has experienced dynamic development and intensive cooperation in wine clusters has led to worldwide fame and significant export successes. Examples, principles and models of successful cooperation within associations and clusters can lead to a generalization of the theoretical approach and inspiration for other clusters in neighbouring countries. The special emphasis to innovative approaches and principles leading to sustainable development in cluster research. The source of research are interviews with cluster managers, and research among winemakers and winegrowers. Further research of trends in target markets.

**Findings:** The values relating to the environment and society are of particular importance in the eyes of the consumer, who acts as a responsible citizen. Moderate regular drinking of classic sparkling wines creates space for education in the areas of sustainability and circular economy of their producers. Sustainability, Certified organic wine, Certified biodynamic wine, Natural wine or raw wine have become part of complex modern business management and marketing of wine clusters specializing in the production of classic sparkling wines. Findings of the research is devoted in detail to the organization the CIVC (Comité Interprofessionnel du Vin de Champagne), the Comité Champagne is trade organisation representing interests of independent producers (vignerons) and Champagne Houses. Champagne to be a fully sustainable region by 2030. The point of view of the organization of a new appellation system for sparkling wines in the Czech Republic is examined in detail with the introduction of the highest Austrian sparkling wine category Sekt G.U. (PDO). Six years ago (2015) local producers set the course for Austrian Sekt with a protected designation of origin and certified quality has been instantly recognizable for consumers via the three quality classes – The Austrian Sekt G.U. Quality Pyramid - of Klassik, Reserve and Grosse Reserve. The inspiration for the intensive cooperation of individual producers is the Method Cape Classic association in South Africa, whose model of operation is excellent in wine tourism and especially in the areas of cooperation on innovation and new sustainable processes.

**Research limitations:** The suggestions for future research is possible in new emerging Moravia Classic Method association created in this year 2021. The identified limitations in the research processes are influenced by pandemic crisis COVID19 and related declines in producer turnover and wine sales throughout the wine world.

**Practical implications:** The implications for organisation in cluster practice, applications and consequences are identified by three examples of clusters (France – CIVC, South Africa – MCC, Austria – Sekt G.U.). All examples of cluster organisation is going to responsible sustainable outcomes.

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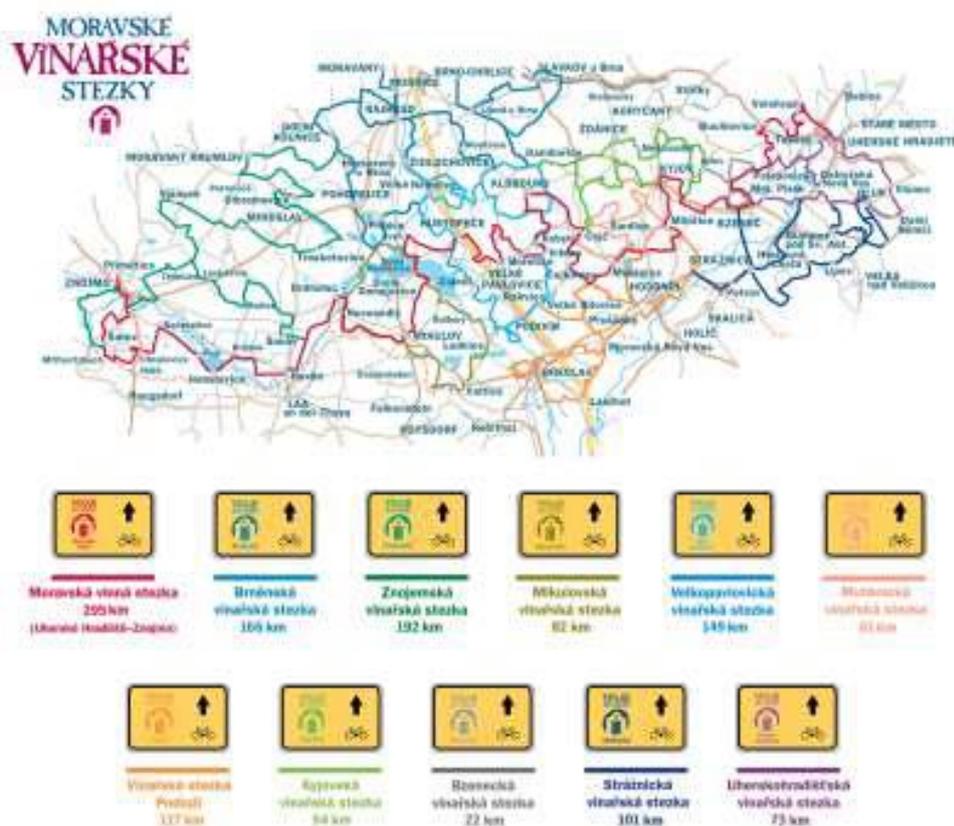


**Key words:** wine clusters, paradox luxury and sustainability, CIVC, MCC, Quality Pyramide

## **Introduction**

Wine production before the Velvet revolution (before 90's) in the Czechoslovakia was focused on quantity and not to allow the development of specialized categories with high value added such as classic method sparkling wine. The whole wine sector subsequently recorded a very slow development of only quantitatively orientation towards production quality and focusing on originality associated with the uniqueness. There are new projects to promote wine with high value added after the beginning of the new millennium.

The permanent trend of development and market growth were the starting potential for the creation of a completely new system of wine trails in South Moravia region. Wine production area with 96% of vineyards is mainly located in this region, southeast part of the Czech Republic. South Moravia is a traditional wine-growing region. Wine production and the associated culture is next to the natural and historical attractions one of the main attractions to visit this site. Tourism and the service sector in general have progressive growth in recent years. Winery, wine and wine tourism are the flagship of South Moravia.



I: Map of Moravian wine trails in the starting plan (Partnership, 2016)

The project Moravian Wine Trails started with activities of Partnership Foundation and for the first time clearly determined the concept of wine tourism and to name needed infrastructure. When we analyzed the starting process of management of project we could find separately "modules" that could be implemented gradually and separately, without losing functionality and threatened the possibility implement other modules.

There are mainly four modules in the beginning of project:

MODUL A - a network of cycle paths:

- total plan of 11 routes connected in a network of 10 regional trails,
  - one main backbone trail with a total length 1200 km;
- MODUL B - the development of services for cycling;
- MODUL C - creating a total product and components of wine tourism;
- MODUL D - on promotion and marketing.

There was in terms of methodology procedures were such as surprising the first of the modules was implemented marketing of trails. So Moravian Wine Trails map was published in the year 2000, or a year before showing the first tracks in the field and 3 years ago marking the completion of the entire network of trails in the country. The services and marketing tools for its development, Project with great vision and ambition proposed the creation of a network of cycle paths, linking all major wine-growing village, the location of vineyards and monuments South Moravian region, extending to “*Uherskohradištsko*” belonging to Zlin Region. Even as the creation of regional tourist products getting ahead of its time in 1998, when there were regional associations of municipalities. They have been established or region. Invitation to collaborate on this project addressed 310 wine villages and farmers, at that time, mostly hidden then behind the curtain of gray economy.

Development of wine tourism is important for the South Moravia region, southeast part of the Czech Republic. In addition, the wine tourism brings revenue side entities operating in agriculture, thereby increasing the standard of living of the population, also brings to the region more jobs and higher income. Tourism and the service sector in general have progressive growth in recent years. Winery, wine and wine tourism are the flagship of South Moravia. In the segment of wine tourism is a dynamic development and is certainly not true that tourists come for winemakers only on so-called "wine cellar evening". Tourists as wine lovers are also interested in the possibility of tours vineyards, own work in the vineyard, and training in the production of wine in the cellar.

The research project follows the development of the regional associations of small and medium-sized wineries cooperating in system for appellations *Vína Originální Certifikace (VOC)*. There are successful forms of wine tourism cooperation in wine clusters -in the world, which can serve as a source of inspiration for the growing cluster initiatives in the Czech Republic.

Cooperation in regional associations, which leads to the creation of new offer of services include wine tourism is strategic business decision, leading to a strengthening effect on the negotiating dynamics in the industry. As stated by Porter (2007) the reason why companies are successful or are falling, the question is in the center of strategy. Porter (1990) was the first in their work using the concept of cluster in the context of wine production, namely on the basis of research work related to wine producers in California, specifically in the Napa and Sonoma Valley. There was started a regional research activities to study winemaking. Before wine from California in the eighties of the last century broke on the export to all over the world, wine production has undergone great development in quality and quantity. This development has attracted some new producers to enter into this industry and also caused the development of other related industries such as wine tourism.

Furthermore research of clusters uniting producers of vine and wine published by Müller and Summer (2005). Formation of wine cluster in New Zealand is researched by Dana and Winstone (2008), in the South Africa by Davidson (2009) and in Chile by Visser (2004).

Aylward (2008) describe the differences in the two types of Australian wine cluster. South Australian Cluster, which can be described as innovative and organizational type cluster in Victoria and New South Wales.

There are also publishing researchers in the Czech Republic, who engaged in the initiatives of local and regional farmers which joint together to market, e.g. Lošťák, Kučerová, Zagata (2006).

Place-based marketing and cooperation winemakers appears frequently in publications from Mitchell and Hall (2006, 2012). The institutional theory and resource based-theory of clusters in wine tourism industry researched also Grimstad (2011).

## Material and methods

To achieve the objectives of the study and an overview of the target market segments requires analysis of the behavior of consumers and providers of wine tourism, which was done by the method of marketing research. For primary data collection system was used RELA (Research Laboratory), which was created in collaboration with the Institute of and Marketing, Faculty of Business and Economics, Mendel University in Brno. Primary data were then processed by MS Excel and Statistica. Results are presented in the form of tables and graphs.

Service providers wine tourism were addressed questionnaires electronically. The source directory of certified equipment was provided by the National Wine Centre. Of the 701 facilities for providers of wine tourism in the wine region of Moravia 674 providers responded. Of the 2400 respondents tourists - wine tourism consumers – responded to the questionnaires 873. Questionnaire was distributed to a consumer in the form of an interview by interviewers and electronically by e-mail. Research at consumers focused on finding the perceptions of consumers on the concept of wine tourism.

In order to identify multiplying effects of wine tourism cluster can use the following macro-analytical tool that recommends Porter (1998):

$$\textit{Localization quotient (LQ)} = \frac{\frac{x}{X}}{\frac{y}{Y}}$$

- LQ - location quotient of employment in the region
- x – the number of employees working in the sector in the region
- X – total number of employees in the region
- y – the number of employees working in the sector in the state
- Y – total number of employees in the state.

Potential for regional clusters is where there are groups of related industries with LQ greater than 1.

To achieve the goals of this research is designed concentration quotient, which is indicating the proportion of vineyards in the region and the total area of vineyards. This concentration factor is calculated for the association of VOCs in the Czech Republic.

$$\text{Concentration quotient (CQ)} = \frac{\frac{a}{A}}{\frac{b}{B}}$$

- CQ – concentration factor area of vineyards in the region / in a certain area for the establishment of an association of wine growers or cluster
- a – the number of vineyards in the region certified by the association rules (ha)
- A – total number of vineyards across the region (ha)
- b – the number of vineyards of the all associations (ha)
- B – the total area of vineyards in the country (ha).

Sources of secondary data are The National Wine Centre, Valtice; Wine Fund of the Czech Republic; Confederation of Commerce and Tourism; Association of hotels and restaurants; CzechTourism; Tourist information centers in South Moravia region; Destination Agencies of the tourist areas.

## Results and Discussion

For further research, it was important to make a categorization of events and services. Based on consultations with experts were chosen individual criteria and design events categorization – the type of markets, festivals, wine tasting with typical local products and special gastronomy in conjunction with wine. Selection of current events is conducted with the aim to create an overall picture of "gastronomic and viticultural peculiarity" of the region of South Moravia.

Selected events meet the priority criteria:

- The focus thematic event for wine and regional products, gastronomic speciality products
- Regional growers, breeders, farmers
- Gastronomic specialities with traditional recipes
- Regional character, to products originating in the region South Moravia respectively, with an overlap in neighboring regions while respecting the wine region Moravia.

The above services will be followed by others which are not directly service designed exclusively for wine tourism, but can also serve its consumers. For example it is possible to rent bicycles or their storage and transportation. Is not only tourists who want to go on a tour of the wine trails, but others who have different objectives.

They're also the possibility to visit historical and cultural sites in the area and related information services. These are main destination for tourists, but for wine tourism may serve as an accompanying program. Likewise, national parks, protected landscape areas and natural attractions are indeed independent tourist destination, but the wine tourism can serve as additional services. Another group of supplementary services are the activities in the area - golf, tennis, windsurfing, fishing, water sports and more.

Evaluation of Satisfaction wine tourism providers with the support and promotion of wine tourism implies a prevailing opinion on the adequacy of support providers wine tourism. A majority of the respondents, namely 55% of the promotion of the wine tourism in the Czech Republic as sufficient, or rather sufficient. On the contrary, as totally inadequate by 10% of respondents assessed. 35% of respondents believe that wine tourism rather insufficient support. We can say that the prevailing positive rating support wine tourism, but positive assessment does not exceed the rating too negative. The proposals to improve support providers primarily suggested more advertising on the Internet and on television. Also suggested holding more wine events. Would welcome further tax cuts and cut red tape. In the field of wine tourism providers suggest more support from the various regions and cities. They would welcome the issue of maps, information brochures, information centers and improve the functioning of signs in the wine, which informed about the possibilities and especially the specific wine tourism providers in the area. Importance for the development of wine tourism, according to providers also improve transport infrastructure in the regions, particularly road repairs lower classes, and also a greater number of car parks and rest areas in the region. Other proposals concerned the involvement of travel agencies and tourist authorities CzechTourism, which should further promote wine tourism driveway.

The most preferred form of advertising on television and internet advertising. You would like to see almost 72% of respondents. Next in line is advertising in the press, would prefer that 54% of respondents. Followed by outdoor advertising, which would be welcomed by almost 35% and radio advertising with 30%. Alternative media, such as city light displays, benches and public transport stops, elected by 28% of respondents. Another form of promotion suggested 13% of respondents.

Providers often suggested cooperation between the National Wine Centre Wine Fund and with travel agents. They would welcome the creation of packages consisting of offering more certified equipment and also to travel agencies more focused on mediating domestic and wine tourism driveway and not on the exit wine tourism. With this and other proposals related to Tourism focused more on the region of South Moravia and wine tourism. Another common theme was greater collaboration among the various actors in the region. And while uniform treatment of wine tourism in the regions. Not only within the region but generally the entire southern Moravia providers should welcome greater mutual awareness of the organized events. It seems reason to avoid collision terms and consumers can visit more actions.

In addition, providers should welcome more wine fairs and exhibitions in the Czech Republic and also more options common presentation of Moravian and Czech

wines abroad. Providers also mentioned the possibility of using "smart phones" via mobile applications related to wine tourism.

Research at consumers focused on finding the perceptions of consumers on the concept of wine tourism. Responses are divided into 14 categories.

As shown in the enclosure, for most respondents, 16.39%, means wine tourism wine tasting combined with a stroll through the vineyards in South Moravia. Fewest respondents that concept associated with a specific wine events. In addition, respondents often associate this term with the term "trip or traveling for wine," or have it linked to journey by bike or on foot along the southern Moravia. With cycling to wine tourism combines 9.84%. Hiking through the vineyards and the cellars imagines 9.02% and the same number is associated with this term vision of the program with sleeping for wine cellar. Hiking in the wine-growing regions and exploring new places (without wine consumption) conceives of 6.56% of the respondents. Similarly, 6.56% of respondents did not know what to imagine under this term. Less frequent responses were then vintage tasting and demonstration of production and wine trails and wine cellars. And overall the most comprehensive list, a wine events, visit wine equipment, cycling, imagine just 2.46% of the respondents.

Source of information on wine tourism is mapped according to research carried out in the picture No.7. Most, nearly 60 % of respondents, the wine tourism learned from the Internet. Another major source of respondents were familiar. Since then learned about wine tourism 48,36 % of respondents. The press and television learned about wine tourism 18,85 %, from family members and from 7,38 % 6,56 % radio. From other sources for wine tourism learned of 7.38% of the respondents

Based on the results of the calculation of the coefficients for the determination of the potential for establishing a cluster and the objective situation in the European market in wine was established design of the cluster, which will be based on the principle of integrated VOC three regions (Pavlovice, Mikulov, Znojmo) with CE South Moravia. The proposed cluster has high coefficients of LQ and CQ (chart II). Due to the relatively high concentration of production resources has potential for competitiveness and clear identification of consumers in the domestic market, and also by Slovak wine market in Central Europe. The scope of activities in the first phase, coordination of services recommended wine tourism in Southern Moravia.

**II: Localization (LQ) and Concentration Quotients (CQ) VOC**

<b>Wine Region</b>	<b>LQ</b>	<b>CQ</b>
VOC Znojmo	1.02	1.51
VOC Modré Hory	1.30	2.46
South Moravia	2.26	2.81

**Conclusion**

Based on the results it can be concluded that the interprofessional association VOC Czech Republic meets the conditions for a cluster. Localization quotient was calculated on the value well above the minimum value. A new alliance of wine producers of VOCs in the Czech Republic also has a concentration quotient larger than a minimum value, and thus fulfills the opportunity for the formation of the cluster.

The plan to create a wine cluster was proposed to establish cooperation between the newly emerging associations of VOC at three sub-regions of South Moravia, in order to achieve competitive advantage in wine tourism.

This paper analyses the potential for wine tourism development and creating a plan for newly formed strategic alliance coordinating services offer all wineries in the region. This study describes the potential to offer services and products of wine growing areas in South Moravia region in the southeast part of the Czech Republic, suitable for promotion offers wine tourism destinations and services. To achieve the objective of the paper was conducted marketing research data collection and mapping current events and activities taking place in the wine-growing region of Moravia, promoting or offering specific local products and services associated with gastronomy and wine.

Based on the results it can be concluded that the interprofessional association VOC Czech Republic meets the conditions for a cluster. The plan to create a wine tourism cluster was proposed to establish cooperation between the newly emerging associations of VOC appellation at three sub-regions of South Moravia, in order to achieve competitive advantage.

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# THE CIRCULAR ECONOMICS OF REVITALIZATION PROCESS OF CONCENTRATED WATER RUNOFF PATHS AND RETENTION RESERVOIRS

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**Abstract:** The problem of erosion and degrading soil in an agricultural landscape is very significant. It is most evident in the areas of the concentrated water runoff paths, particularly on the parts of the land blocks, where they are extremely exposed to the form of erosion furrows, through which the water flushes the arable topsoil from the surface. As an effective agri-environmental and climate defence tool, the grassing of these concentrated water runoff paths on arable soil. During this period of climate change, the intensity of heavy rains increases, which causes extreme erosion events. At the same time, it causes unacceptable soil loss from neighbouring land and burdens grassy tracks of concentrated water runoff paths with sediment. This reduces subsequent functionality of concentrated water runoff paths because of a violation of grassland compatibility. The absence of grass in these critical places during repeated torrential rains promotes erosion and subsequent degradation of the soil, as the water drains on it faster than on a properly grassed area. In order to achieve the desired functionality of the measure, for instance, the anti-erosion function, the grassland must be maintained at a reasonable condition, height, and must be above all continuously free from sediment deposits from previous erosion events. For this reason, it is necessary to remove colluvium and accumulated sediment from grassland after erosion events by revitalizing the grassland.

**Purpose:** The main objective of the paper is to propose a solution to diversification of economic activities - production of different commodities, soil protection, sustainable management and by-products with possible economic effects. Part of the research is the product development from soil sediment, like organic matter demanded by agricultural operations for subsequent recultivation including related economic analysis of the whole process).

**Methodology:** Authors analyzed the Rural Development Program and related indicators from the period 2016-2020 and at the same time a literature review of selected demonstration objects. Authors also analyzed the procedure with selected techniques, technologies and agricultural mechanization. We found that no procedure has been yet established for this kind of revitalization, no technique or technology has been developed that would allow the required maintenance operations of these agri-environmental measures and landscape elements. Standard agricultural machinery and mechanization are not functional and suitable. It is necessary to address the problem, which will contribute to the development of the circular economy in this sector and the utilization of erosive sediment.

**Findings:** With suitable machinery and appropriate technology, we would be able to remove the eroded sediment and then re-use it for next possible usage in agricultural sector. However, the current type of machinery that is available today is not apt to take on such a complex task of processing the colluvium taken from the concentrated water runoff paths and retention reservoirs.

**Key words:** Concentrated water runoff path, retention water reservoir, erosion sediment, circular economy, soil protection, agricultural mechanization

**JEL category:** Q01, Q15, Q16, Q24, O31, O33

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## Introduction

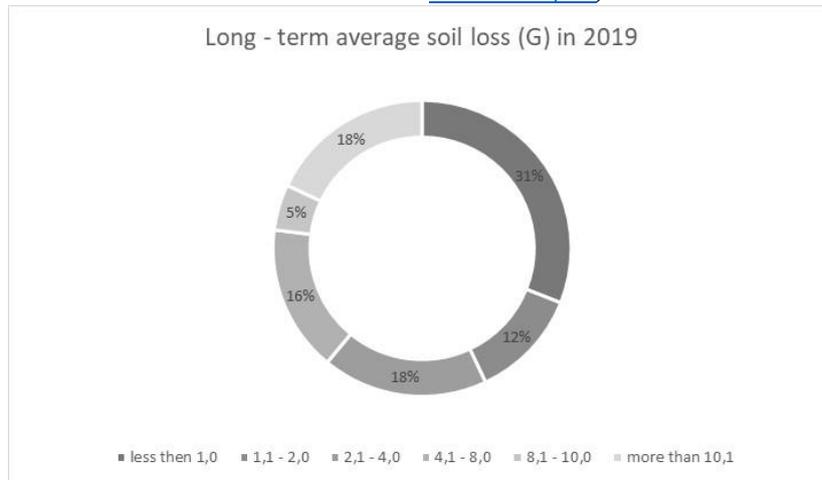
The problem of erosion and degrading soil in an agricultural landscape is very significant. It is most evident in the areas of the concentrated water runoff paths, particularly on the parts of the land blocks, where they are extremely exposed to the form of erosion furrows, through which the water flushes the arable topsoil from the surface. As an effective agri-environmental and climate defence tool, the grassing of these concentrated water runoff paths on arable soil. During this period of climate change, the intensity of heavy rains increases, which causes extreme erosion events. At the same time, it causes unacceptable soil loss from neighbouring land and burdens grassy tracks of concentrated water runoff paths with sediment. This reduces subsequent functionality of concentrated water runoff paths because of a violation of grassland compatibility. The absence of grass in these critical places during repeated torrential rain promotes erosion and subsequent degradation of the soil, as the water drains on it faster than on a properly grassed area. In order to achieve the desired functionality of the measure, for instance, the anti-erosion function, the grassland must be maintained at a reasonable condition, height, must be above all continuously free from sediment deposits from previous erosion events.

For this reason, it is necessary to remove colluvium and accumulated sediment from grassland after erosion events by revitalizing the grassland. The main objective of this paper is to propose a solution to diversification of economic activities - production of different commodities, soil protection, sustainable management and by-products with possible economic effects. Part of the research is the product development from soil sediment, like organic matter demanded by agricultural operations for subsequent recultivation including related economic analysis of the whole process.

## Literature review

We often encounter the problem of erosion in an agricultural landscape (Fiener, P, 2017; Kirkby, M.J. 2010). More than 53% of the territory of the Czech Republic is covered by an agricultural land (Ministry of Agriculture, 2019). The area of this land - a natural resource, has been degrading for a long time. A significant influence of the intensification of agriculture and the unification of agricultural land management is only deepening the ongoing degradation processes (Slabe-Erker, R, at all. 2019). The most significant soil degradation processes were identified as water erosion, wind erosion (locally), loss of organic matter, soil compaction, soil contamination, reduction of microbial activity in soils, others in the soil are waterlogged soils, accelerated runoff, stopping of agricultural land (Žalud, Z. a et al., 2020; Oostt, van K. at all., 2007). The potential threat for our agricultural land from water erosion in the Czech Republic, expressed by long-term average soil shear (G) is evaluated in Figure 1. It is based on the *USLE equation* (Wischmeier and Smith, 1978) using vegetation protection factor C according to climatic regions and expresses values of long-term average soil shear (G).

**Figure 1. Long-term average soil loss (G) in 2019 - potential threat to agricultural agriculture in the Czech Republic from water erosion (source: [www.vumop.cz](http://www.vumop.cz))**



Water erosion is becoming a significant problem in the Czech Republic due to some extreme hydrological phenomena in recent years in terms of soil degradation. Valuable land which is carried to the neighboring lands by concentrated surface runoffs during torrential rains and subsequently transported to the built-up areas of the municipalities, causes damage to property and also enters the hydrographic networks. In water streams and reservoirs, the soil sediments and mixes with a pollution, which makes valuable soil toxic waste that cannot be used for reclamation and it is necessary to get rid of such waste.

Manifestations of erosion occurring on source land in the basin due to surface runoff are divided into surface and groove erosion and erosion causing ephemeral deep grooves in the paths of concentrated surface runoff (LARFEN, J. M. et al. 1985).

In particular, to reduce water erosion, wind erosion and reduce water runoff from parts of land blocks with arable land, the Ministry of Agriculture prefers and supports agri-environmental and climate measures "Grassing of concentrated runoff tracks" and "Grassing and greening of valleys" as the establishment of new landscape elements (Vejvodová A., 2016; MZe, 2020).

Farmers are motivated to create and subsequently manage functional measures; however, appropriate procedures, techniques and technologies are not currently in place for the management and maintenance of these landscape features. Especially for conditions where, after erosion events from the cultivated agricultural land in the vicinity of these grassy areas, the outflowing water transports sediment, which is settled on the grassed area of the measure; this damages the grassland and measures taken with regard to future erosion events and they lose functionality.

In particular, a suitable agricultural technique (or a working tool) in aggregation with available mobile energy means, thanks to which it would be possible to "cut off" alluvial sediment, revitalize the involved grassland, transport the sediment and

then landfill (collect for subsequent use) without damaging the involved grassland, has not yet been invented (Kumhála, F., 2007). If the erosive sediment is subsequently removed, this happens exceptionally, especially from land parcels and buildings outside the agricultural land (Marada et al. 2010) without further treatment and subsequent targeted use. The issue of landscape lawns, which perform mainly non-productive functions, especially procedures for their restoration and establishment, is addressed most recently in the standards of care for nature and landscape issued by the Nature and Landscape Protection Agency (SPPK C02 007: 2018 Landscape lawns). This document also does not set out procedures for the revitalization and rehabilitation of concentrated water runoff paths after erosion events on which landscape lawns are located.

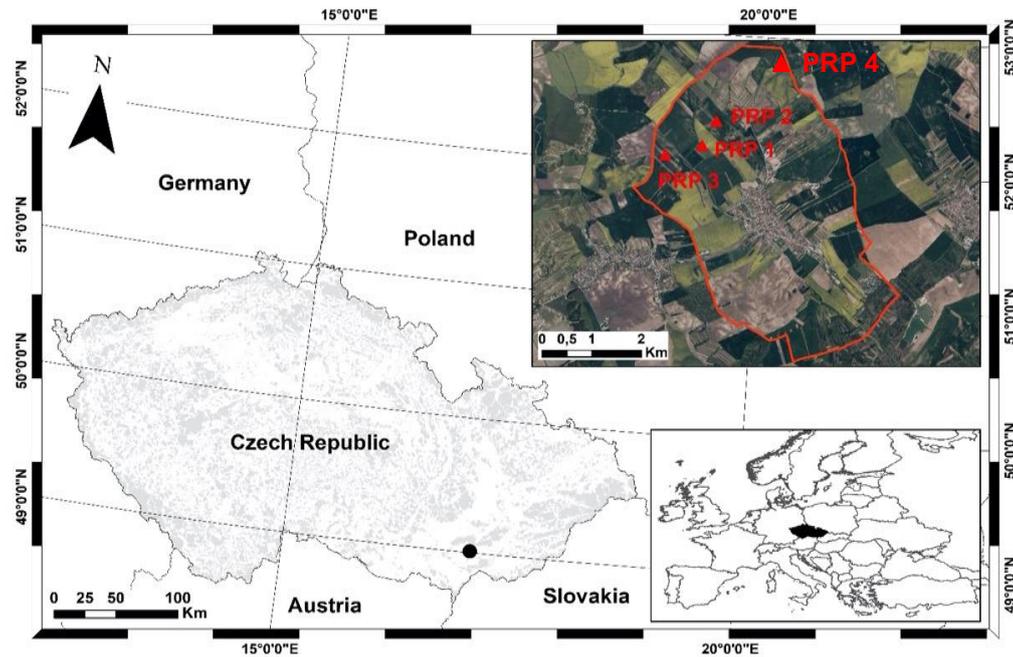
Therefore, the object of the research in the case study is determine specific characteristics of the eroded sediment and determine potential - the size of areas in the Czech Republic that would require such revitalization. In the next part, we analyze suitable technique for the management of grassy tracks of concentrated water runoff and technology for the management of this raw material and determine possibility to subsequently use eroded sediment in order to analyze economically interesting raw material to be used for the subsequent recultivation of degraded areas (Luc, M. and Szmanda, J.B., 2015; Greblikaitė, J at all. 2020).

## **Methodology**

In solving the problem, we used the methods applied at the Institute of Landscape Water Management, University of Technology, Brno, which has a pedological laboratory for the possibility of processing soil samples (physical properties of soil, analysis of intact soil sample, saturated hydraulic conductivity, etc.). Previous research on the physical properties of soil has been carried out on the basis of available and published methodologies, published, for example, by Dumbrovský et al. (2019), Dumbrovský and Larišová (2016), Dumbrovský et al. (2011).

The researchers based their research on experience with issues related to surface erosion, groove erosion and erosion in ephemeral grooves, which are discussed in Dumbrovský et al. (2020), Sobotková and Dumbrovský (2014), and the utility model Dumbrovský and Sobotková (2012). The procedures presented in these publications have been and will be used in research to determine the parameterization of concentrated water runoff paths, subsequent determination of grass mixtures that are able to withstand the tangential tension of surface runoff, remediation and maintenance of water runoff paths. Furthermore, the experience with the design of anti-erosion protection measures and their implementation in landscaping specified in the methodologies of Doležal, Dumbrovský et al. (2016), Dumbrovský and Sobotková (2015) and in the publication Dumbrovský, Sobotková et al. (2014) which compares the effect of a line protection measure on damage to property in the village. For a successful project solution, grassy valleys were established and maintained in cadastral area of Nenkovice and Šardice (Marada et al. 2019).

*Figure 2. Location of established permanent research areas (symbol ▲) in the cadastral area of Šardice and Nenkovice (symbol ●) in the South-Eastern part of Moravia, the Czech Republic. The gray layer on the map shows the forested areas of the Czech Republic.*



In order to determine the size of areas with the potential for subsequent management, maintenance, removal and subsequent use of erosion sediment, the analytical part of the Strategic Plan of Support of the Common Agricultural Policy for 2021-2027 (Ministry of Agriculture, 2020) and the subsequent plan within the intervention Agri-environmental and Climate Measures soil „Grassing of the Arable Land“, the available information provided by the State Agricultural Intervention Fund was also used. The Fund also publishes information on the real payments proceeded to farmers for the measures taken.

The Methodology for evaluating the **potential of the total amount of colluvisions:**

$$PCMK = \sum (ZDSO \cdot \emptyset PME0);$$

$$ZDSO=(DSO + OOP + OP + Mo + Sa + Vi + Biop + KP))$$

where:

PME0 – permissible erosion risk rate

DSO – acreage of concentrated water runoff paths

Mo – Wetland

Sa – Orchard

Vi – vineyard

Biop – bio-corridor

KP – landscape element

OP – protected zone

OOP – protected zone on arable land

### **Economics of grassed tracks of concentrated water runoff focused on the production of forage and soil-forming substrate**

The Methodology for evaluating the economic efficiency of agroforestry systems from the farmer's point of view was used to determine the economics of administration and maintenance of grassed concentrated water runoff paths (Lojka, B. et al. 2020).

NPV scenario **without** implementation of grassed concentrated runoff water paths:

$$NPV_{konv} = \sum_{t=1}^{Tp} (q_t \cdot c_t + SAPS_t - v_t) \cdot h \cdot (1 + r_n)^{-t} \quad (1)$$

where the following means:

Tp ... Evaluation time derived from element functionality [year]

q<sub>t</sub>... Crop yield cultivated in „t“ year of crop rotation [t / ha]

c<sub>t</sub>... Sales market price commodities grown in „t“ year [CZK / t]

SAPS<sub>t</sub>... Subsidy based on area in „t“ year [CZK / ha]

v<sub>t</sub> ... Specific spending on crop cultivation in „t“ year [CZK / ha]

h ... Total area of land analyzed [ha]

r<sub>n</sub> ... Nominal discount rate [usually 5 - 10%]

NPV scenario **with** implementation of grassed concentrated runoff water paths:

$$NPV_{konv, DSO} = \sum_{t=1}^{Tp} [(q_t \cdot c_t + SAPS_t - v_t) \cdot h_{konv} + (Q_t \cdot C_{ref,t} + DOT_t - V_t) \cdot h_{DSO}] \cdot (1 + r_n)^{-t} \quad (2)$$

Where:

$h_{konv}$  ... Area for conventional crops [ha]

$Q_t$ ... Crop yield of substrate in „t“ year [t /ha]

$C_{ref,t}$  ... Reference price of the soil-forming substrate in „t“ year [Kč/t]

$DOT_t$  ... Subsidy related to area in „t“ year [Kč/ha]

$V_t$  ... grassed concentrated runoff water paths administration and maintenance expenditure in „t“ year [CZK / ha], including the cost of establishing

$h_{DSO}$  ... area of grassed concentrated runoff water paths [ha]

There is thus a comparison of the NPV of these two scenarios. Implementation of the grassed concentrated runoff water paths is effective if  $NPV_{konv,DSO}$  is higher than  $NPV_{konv}$ .

If we consider  $DOT_t = SAPSt$  and yields (in tonnes per hectare) biomass and soil-forming substrate and conventional crops for directly proportional to "occupied" area, then evaluation can be simplified to this equation:

$$NPV_{delta} = \sum_{t=1}^{Tp} [(Q_t \cdot C_{ref,t} - V_t) - (q_t \cdot c_t - v_t)] \cdot (1 + r_n)^{-t} \quad (3)$$

If  $NPV_{delta}$  is positive, then, the implementation of the grassed concentrated runoff water paths under the assumptions and purely economic rating is for producer, this is to say farmer, effective.

### **Analysis of a suitable technique for managing grassed tracks of concentrated runoff and technology for handling this raw material**

Machines for earthworks and land reclamation works were evaluated - dozers, scrapers, graders (Tlapák, V., Filip, J. 1986) and subsequently technical and technological requirements for excavators - working tools for decoupling soils - eroded sediment from grassland. At the same time, the available methodology for the management and maintenance of similar areas abroad (Water Environment Services (WES) Of Clackamas County: 2020) was analyzed.

### **Utilization of eroded sediment**

The price of the eroded sediment will be influenced in principle by supply and demand. The prices for Horticultural substrate or soil for lawns, which is commercially available for prices in the 6th month of 2021 at the level of CZK 1,300 can be used as a guide value and basis for valuation  $m^{-3}$ .

### **Results and discussion**

From the available information of the State Agricultural Intervention Fund, it was found that in 2019 7 applicants were supported in the amount of CZK 956,521 for grassing the concentrated runoff tracks and in 2020 8 applicants in the amount of CZK 1,000,000 were supported. The annual amount of support is set at 560 EUR / ha of grassland area. The exchange rate for calculating rates for subsidies for which

a subsidy application was submitted in 2021 applies the exchange rate of 26.242 CZK/EUR.

### **The total area of grassed tracks of concentrated runoff**

Based on this, we can determine that in 2019, 65 ha of arable land was grassed with support and in 2020 the supported grassed area was increased by 3 ha to 68 ha of former arable land.

This area, as a potential, needs to be amplified by selected areas of arable land that have been grassed as difficult to cultivate. Furthermore, as an interruption strip dividing the soil blocks and last but not least as protective strips for protected crops (eg. maize). It is also impossible to omit the areas that were greened after complex landscaping as grassed and greened valley and grassy sags.

### **The potential of the total amount of colluvsions**

Based on the analysis of the Strategic Plan of Support of the Common Agricultural Policy for the period 2021–2027 (Ministry of Agriculture 2020), within the intervention Agri-environmental and climate measure "Grassing of Arable Land", it is considered that in the following years until 2027 will be grassed up to 9 848 ha of agricultural land in places of concentrated drainage paths.

**Table 1. Planned grassing targeted for soil protection (ha)**

Year	2022	2023	2024	2025	2026	2027
ha	-	3283	4924	6566	8207	9848

It is expected that eroded sediment will accumulate on grassy areas in the amount of at least 5 t.ha<sup>-1</sup>.year<sup>-1</sup> (average value of the permissible degree of erosion risk set in the currently valid anti-erosion decree)

**Table 2. Permissible erosion risk rate (PMEO)**

Characteristics of land	Depth of land	Value of the 5th digit of the BPEJ code (combined soil skeletalness and soil depth code)	Permissible erosion risk rate (t.ha <sup>-1</sup> .year <sup>-1</sup> )
Deep land	> 60 cm	0, 2, 3,	9,0
Semi-deep land	30 - 60 cm	1, 4, 7*	9,0
Shallow land	< 30 cm	5, 6, 8*, 9*	2,0

Given the size of the areas that are currently grassed and that will be grassed, the potential for revitalization is and will be significant.

### **Specification of the eroded sediment**

Analyzes have shown that the technical properties of eroded sediment are most similar to colluvium; these are soils with *Ap - Ak - stratigraphy*, arising from the

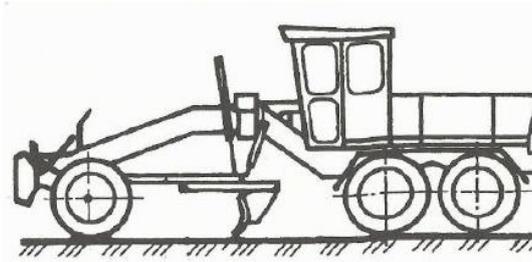
accumulation of erosive sediments in the lower parts of the slopes and in the concave elements of the slopes and terrain sags. These soils have not yet been mapped. Defining them will help in assessing the actual erosion.

According to Zádorová (2009), colluvium is a newly introduced soil type, appearing as a separate unit only in some taxonomic systems. Colluvium is caused by the gradual accumulation of humus material displaced from erosively exposed parts of the land. Its occurrence is influenced by the character of the relief - it is located almost exclusively in places of decrease in the carrying capacity of water flowing down the slope, *e.g.* in concave elements of the slope (these include microrelief depressions, side valleys and falls) and behind terrain obstacles of natural and anthropogenic character (Němeček et al 2001) and especially in the grassy paths of concentrated runoff. During an intensive collapse, the floodplain is often filled with colluvial sediments, leading to the formation of polygenetic soils of fluvial-colluvial character (Houben et al. 2006).

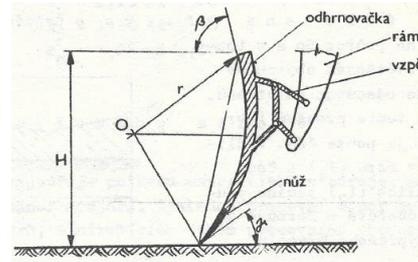
In Czech taxonomy (Němeček et al. 2001) the accumulated horizon is marked A<sub>zx</sub> (humus anthropic horizon created by layering the material of humus horizons) and its minimum thickness necessary for the identification of a colluvium is 0.25 m (i.e. together with the A<sub>p</sub> horizon with an average depth of 0, 25 m is a 0.5 m thick humus horizon). According to the Czech taxonomic system, it would be possible to denote this layered, mineral horizon as B<sub>z</sub> or C<sub>z</sub> (Němeček et al. 2001).

#### **Design of suitable techniques and technologies for handling this raw material, for which subsequent use is offered**

The most suitable and usable technique for further development appears to be a universal tractor machine on a wheeled chassis with a large wheelbase, manufactured in a two-axle design with the aim of removing sediment and then moving it from the land and folding it to a designated place for transport. The mechanization with the lowest possible operating weight will be selected. The wheelbase between the front and rear axles ensures favorable conditions for the accuracy of the work tool and the possibility to manipulate it in the middle of the machine and outside it. The disadvantage is the large turning radius and small maneuverability of the machine (Vaněk, A. 2003). These machines are designed for surface movement of soils and subsequent revitalization of grassed DSO. In traffic construction, they are mainly used for removing topsoil, modifying the ground plan, spreading the material and creating embankments and ditches. Modification of the working tool and the tool for material transfer (body, transporter) will be the subject of the following research and development.



**Figure 5. A universal tractor machine on a wheeled chassis with a large wheelbase, manufactured in a two-axle design**



**Figure 6. The radius of curvature ( $r$ ), the cutting angle ( $\gamma$ ), the rolling angle ( $\beta$ ) and the position of the blade in the ground section ( $\alpha$ ) will play an important role in the design and development of the working tool – blade. (núž = blade, vzpera = strut, rám = frame, odhrnovačka = flail mower)**

For the subsequent use of the removed eroded sediment, it will be essential to develop a conveyor on which the "cut" erosion sediment will be loaded immediately. It is realistic to use the system used in scrapers, with the condition that the machine will be very light with regard to the specific gravity of erosive sediment, which will make it impossible to use commonly used mechanization.

### **Economics of grassed tracks of concentrated runoff focused on the production of forage and soil-forming substrate**

Thanks to the establishment of a grassy path of concentrated water runoff, sustainable management can be expected with savings in the costs of damage caused by erosion and an increase in revenues related to the production of biomass and soil-forming substrate. This measure is expected to diversify revenues (revenues from the production of soil-forming substrate, which will be generated from the raw material of eroded sediment and from the production of biomass and related agricultural production) and therefore, the long-term goal of increasing overall revenues. In the economic decision-making of farmers, whether and, if so, which measures to put in place in order to prevent and minimize erosion, in the current conditions, the primary activity of agricultural production of biomass intended for food, feeding and other activities remains a complementary function for farmers and their economy. The combination of conventional agriculture with other production associated with the grassing of concentrated runoff pathways leads to a partial reduction in land area for crops intended for biomass production for food, feed and energy transformation), thus reducing the economic effect of conventional crops. The area of grassed concentrated runoff path (DSO) is used for by-products with

possible economic effects (e.g. from the sale of a by-product - biomass, soil-forming substrate, etc.).

Side activities are also interesting from an economic point of view, because in addition to the effect from the sale of biomass and substrate brings other qualitative and quantitative effects such as:

- Diversification of economic activities – production of different commodities is produced which are bound to different markets;
- Potential improvement in cash flow producer, eg. In the case of biomass and substrate production, together with traditional crops, producer has a significant cash flow throughout the year, besides the harvest of the main (conventional) commodity;
- Keeping the quality and consumption of land directly determines not only the price of the land, but can also positively affect revenues in the neighborhood of grown crops.

Analysis of economic efficiency of administration and revitalization of grassed drains of concentrated drains can be done from two views, and:

1. From the producer's point of view – farmer's perspective, which is primarily interested in the overall economic efficiency of land use, which is available for growing activities, it primarily does not take into account any other non-production (societal) effects (see above) from the implementation of the grassy concentrated runoff water paths, if they do not bring direct economic benefits;
2. From a wider systemic view where other items in the economic evaluation of the grassy concentrated runoff water paths may be reflected in the form of awards of non-production functions of the grassy concentrated runoff water paths. Only these two scenarios are solved in case study. Benefits, according to the point two (systematical aspects), however, can serve as an argument platform for any justification for the introduction of an additional grassy concentrated runoff water paths economic support, such as subsidies.

#### **Economic effectiveness of the grassy concentrated runoff water paths administration and maintenance**

In the case of economic evaluation of grassy concentrated runoff water paths (combination of a classical agriculture with the management and maintenance of grassland and sediment), the economic benefits can be evaluated by three approaches:

- Analysis of economic efficiency of stands with a goal (for entered inputs awarded by market Price and size of biomass production or soil-forming substrate) Find a minimum price
- Production created from erosion sediment, which will provide the producer to the required economic effect in the form of revenue from the initial investment in its discount

- Analysis of the economic efficiency of stands with the attentive possibilities of land use - typically for conventional agricultural production. In the event of an analysis of the economic efficiency of grassy concentrated runoff water paths, the second approach is used; The effect of the implementation of secondary activity (sale of biomass and soil-forming substrate) is analyzed on the economic efficiency of the total use of the land. Conventional (classical) agricultural production is considered primary production, other activity – e.g. biomass production, soil-forming stratum from grassed tracks - is then considered as secondary production. The substrate production is not a minimum price, but the reference price of the commodity is used. For the specified expenditure associated with the implementation of this secondary activity, the amount of production and its valuation of the reference price, the economic effect is determined from this secondary production and compared with the effect that should implement conventional production on the area used for plant growing.

### **Economic evaluation of grassed concentrated runoff water paths**

- In particular, the assumptions based on the general methodology of the economic evaluation of the biomass and soil-forming substrate are used to create the Economic Efficiency Method.
- Agricultural land is contemplated that does not have restrictions on both conventional crop production and grassed concentrated runoff water paths cultivation;
- Considering the possible different business risk of conventional agricultural production and secondary activities associated with the implementation of grassed concentrated runoff water paths;
- The evaluation is based on the simulation of cash flows related to conventional agricultural productions and secondary production and on the calculation of net present value - NPV;
- Engraved grassed concentrated runoff water paths assumes implementation of activities with a longer period of duration than one year, and therefore economic evaluation is carried out over the duration of this secondary economic activity, eg. In the event of the implementation of grassed belts, the comparison is carried out for the expected time of the element or restoration of grassland at least 5 years;
- For conventional agricultural production is expected to rotate (alternative) crops according to the recommended consecutive procedures;
- The evaluation is carried out when respecting standard market conditions - all activities are valued at market prices - eg individual agrotechnology;
- The evaluation is carried out in normal (nominal) prices, cost escalation of cost entries according to average long-term inflation (appropriate price index - prices of industrial and agricultural services, etc.);
- Income tax (relevant for the agrarian sector) is assumed, grassed concentrated runoff water paths consolidation with other activities of the farm is not considered
- The time value of money (in analyzing and calculations based on NPV) is expressed by a nominal discount (including inflation);

- If the subsidy is granted, the model is taking them into account.

If we apply the above principles of grassed concentrated runoff water paths based on the combination of grassed concentrated runoff water paths agricultural production and maintenance, including biomass production and the production of the soil-forming substrate, this evaluation is based on the comparison of the economic efficiency of two variants:

- Land use variants without landscaped grassed concentrated runoff water paths - only agricultural production with crop rotation; The evaluation time is equal to the functionality of grassed DSO;
- Soil use variants with a cloudy grassed concentrated runoff water paths - on the desktop, which remains dedicated for conventional production is applied to the same rotation of crops as in the case without grassed concentrated runoff water paths implementation.

The hydrological regime - water balance is also significant. The breakdown of the soil block part of the grassed valley or grassed concentrated runoff water paths may also have a positive impact on the conventional crop yields (e.g., improving microclimatic conditions, increasing flood and dry resistance, reduction of temperature fluctuations and evaporation, limitation of soil erosion, etc.). However, in particular, there are significant non-productive benefits that have not yet been awarded and not appreciated and their contribution is considerable to environmental, but also long-term sustainability of management and securing of soil fertility in the evaluation of grassed concentrated runoff water paths. Non-productive functions of grassed concentrated runoff water paths are also the main reason why they are supported by subsidies. The aim is to protect the land, increase the ecological stability of the landscape and also to prevent a reduction of revenue, as is the case for agroforestry, the forming substrate may yield the required returns to farmer and a society on the whole.

## Conclusions

For this specific type of farming - revitalization has not yet been established. Functional and systematic procedure, special technique or technologies have not yet been developed which would allow the required operations of administration and maintenance of these agri-environmental measures and landscape elements. Standard agricultural machinery, machines used for earthworks and usable mechanization are not functional and appropriate. Not only for this reason, it is necessary to address the problem that will contribute to the development of the circular economy in this sector with the aim of applying the eroded sediment as a significant raw material usable to revitalize the damaged areas or as a substrate used in horticulture and related fields. Research should be subsequently aimed at developing a product with clear parameters, its specifications and valuation so that its production is interesting for manufacturers and requested by the farmers or other agricultural land users. Design of suitable techniques and technologies for handling this raw material for which subsequent use is offered. The implementation of design

and development is based on the principles specified in the standard ČSN EN ISO 9001: 2016. During the planning of design and development, the following will be determined, in accordance with the created project:

- design and development stages,
- the examinations, verifications and validations that are appropriate to perform at each stage of the design and development, and
- specify the responsibilities of the researchers and the powers of design and development.

Inputs related to the requirements for grassland management and care processes will be identified and the product being developed is identified and records will be maintained. These inputs will be included:

- requirements for the functionality of work tools,
- applicable legal and regulatory requirements,
- information derived from previous similar proposals, and
- other requirements that are essential for design and development.

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# THE FOOD LOSSES AND FOOD WASTE IT'S IMPACT AND INITIATIVES ON ENVIRONMENTAL MANAGEMENT IN THE SLOVAK REPUBLIC

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**Abstract:** Although there are no accurate data in the world on food losses and waste, according to the FAO, globally about one third of the food produced is lost or degraded as waste along the food chain, from production to consumption. The large scale of food losses and waste leads responsible politicians and strong economic players not to see this as a coincidence, but as an integral part of food systems. Successful reduction of food losses and food waste will save natural resources for future generations and has the potential to improve food security and nutrition by meeting the goals of the Agenda 2030 on Sustainable Development Goal n. 2: No hunger and Goal n. 12: Responsible consumption and production. We are witnessing a growing support for methods of sustainable agricultural production, which include e.g. also agroecology, sustainable intensification, climate-friendly agriculture, or smart technologies. Sustainability means the long-term ability of food systems to provide current food security so as not to threaten the environmental, economic and social ecosystems that generate food security and nutrition for present and future generations

**Purpose:** Goal of the article is to point out on sustainable agriculture, food losses and waste in terms of environmental requirements in relation to food safety and nutrition. Sustainable agriculture and sustainable access to natural resources play an important role in securing current and future generations of food production.

**Design:** In order to obtain primary data there were 5 surveys were carried out in the Slovak republic. Surveys were carried out in agricultural enterprises, food processing enterprises, retail, distribution and catering establishments and in Slovak households in the period from September 2019 to August 2020. Based on results of the surveys article presents overall summary of obtained data.

**Findings:** Climate change is affecting agriculture, including lower yields and productivity, drought and water scarcity, extreme temperature stresses, lower forest productivity, weed growth and new diseases caused by viruses and foodborne diseases. All this leads to rising prices, has a negative impact on health, food security and nutrition. Increasing weather variability and natural disasters associated with climate change have multiplier effects on agricultural production, which significantly affects food trade and food consumption.

**Key words:** food waste, food losses, sustainability, food systems, environmental management

## Introduction

Despite the urgency and severity of this global problem, there is currently no uniform definition of food waste, food loss or food waste. The most common definition is by FAO (2014) which defines food losses as a reduction in the quantity or quality of food, regardless of the causes originally intended for human

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consumption, with a reduction occurring at all stages of the food chain from harvest to harvest and ending in consumption. MARD SR (2016) also defines the term food loss, which means the amount of food that is produced for human consumption, but for various reasons is lost from the food chain. It is the difference in the quantity of food under Article 2 of Regulation No. 178/2002 at the beginning of the food chain (moment of leaving the farm) and the amount of food at the end of the food chain (use by the final consumer). Food losses can be generated before, during or after the preparation of food in households, as well as food losses occurs through activities that are also carried out by commercial establishments and catering services.

Food waste is any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed, including the following destinations: composting, crops ploughed in/not harvested, anaerobic digestion, bio-energy production, co-generation, incineration, disposal to sewer, landfill or discarded to sea but not including food or inedible parts of food removed from the food supply chain to be sent to animal feed or bio-based material/chemistry processing (Tostivint et al., 2016).

### **Research background**

Food losses and food waste are expressed in caloric values in some studies. This caloric approach seeks to more effectively express food losses and food waste along the entire food supply chain. This concept applies the optics of "caloric efficiency" of food systems, expressing the fact that as food systems of plant and animal products proceed in the transformation of the original calories into calories intended for human consumption and how these are effectively used in the final phase of consumption. Such caloric expression of food losses was also used by the authors in their publication "Future Food Systems" (2020).

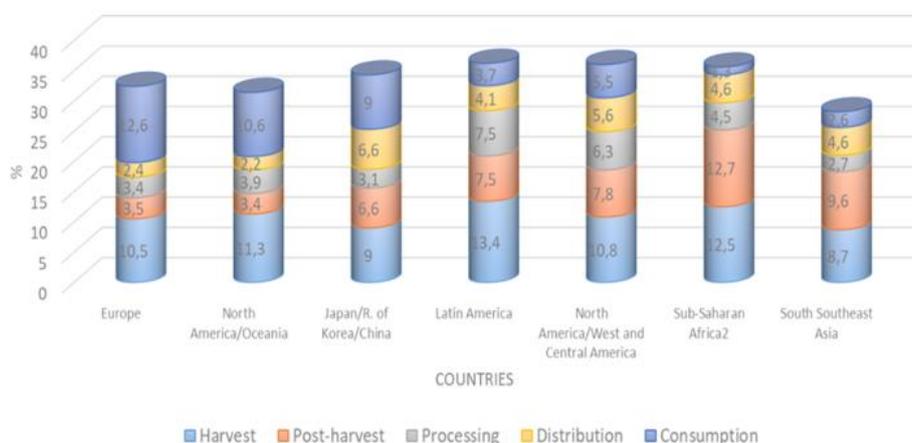
The backward or lack of infrastructure related to existing post-harvest technologies and storage structures plays an important role in food losses, which severely limits the ability of these countries to transform their agricultural production into food products that can be stored, especially for fruits and vegetables. The result of such a weak post-harvest and storage infrastructure, as well as limited transport options, cause a large volume of food waste.

Food losses and waste have a significant impact on food sufficiency. (Alexander et al., 2017). According to FAO estimates, in 2016, 13.8% of food produced was lost in the food chain, from farm levels to food storage, before it entered the commercial network (FAO 2019). This figure does not include food waste caused by consumers, which is of high value, especially in developed countries and urban agglomerations. below shows the distribution of food losses and waste along the supply chain in a world (Table 3).

**Table 3. Proportion of food waste at different stages of the food supply chain according to different available studies (in %)**

	FAO (data for Europe)	Foodspill (Finland)	FH Münster (Germany)	Bio Intelligence Service (EU)	Fusions (7RP)
Production	23	19 - 23	22	34,2	11
Processing industry	17	17 - 20	36	19,5	19
Retails	9	30 - 32	3	5,1	17
Consumers	52	28 - 31	40	41,2	53

Source: WRI analyse based on study Global food losses and food waste, FAO 2011. Rím: FAO OSN: Jun 2013; <http://www.mtt.fi/foodspill>, 2011; <https://www.fh-muenster.de/isun/lebensmittelabfall-projekte.php>, 2012; (Gustavsson et al., 2013); FUSIONS, „Estimation of food waste in Europe“, 2016.



**Figure 1. Distribution of the food losses and food waste along the supply chain**

Source: The future of food and agriculture. Trends and challenges, 2017, FAO, p.114, ISBN 978-92-5-109551-5

Food systems intersect with other systems that are directly related to sustainable development goals (SDGs) e.g. Progress towards Sustainable Development Goal 2 of Agenda 2030 "Zero hunger" directly affects Goal 3 on health and vice versa. Sustainable Development Goal 6 on access to clean water and sanitation infrastructure is essential for food production as well as for human nutrition. Goal 12 on responsible production and consumption is important for achieving sustainable food security and nutrition. Goal 13 on responsible fishing and 15 on biodiversity

are equally directly related to Goal 2 "Zero hunger", just as aquatic and terrestrial ecosystems support food production.

According to HLPE (2014), food systems concentrate all components (environment, people, inputs, processes, infrastructures, institutions, etc.), activities related to the production, processing, distribution, preparation and consumption of food and the outputs of these activities, including social, economic and environmental results.

Sustainable agriculture and sustainable access to natural resources play an important role in securing current and future generations of food production. We are witnessing a growing support for methods of sustainable agricultural production - which includes e.g. also agroecology, sustainable intensification, climate-friendly agriculture, or smart technologies. Sustainability is understood in the wider literature as an integral part of the concept of food security (Lang and Barling, 2012; Garnett, 2013; Berry et al., 2015; Béné et al., 2019) and is the central idea of policy initiatives related to sustainable development goals. Sustainability means the long-term ability of food systems to provide current food security without compromising the environmental, economic and social ecosystems that generate food security and nutrition for current and future generations (HLPE, 2020). Sustainability as a dimension of food security applies the practice of food systems that long-term respect and protect ecosystems in conjunction with the economic and social systems needed for food security and nutrition (El Bilali et al., 2017).

## **Methodology**

Goal of the article is to point out on sustainable agriculture, food losses and waste in terms of environmental requirements in relation to food safety and nutrition. In order to meet the set goal, 5 surveys were carried out, which were realized in agricultural enterprises (45 farms), food processing enterprises (42 companies), retail, distribution and catering establishments (442 subjects) and in Slovak households (2068 households) in the period from September 2019 to August 2020. Based on results of the surveys article presents overall summary of obtained data, impact of food waste on economy, environment and society and presents initiatives which should be carried in order to improve environmental management in the Slovak republic.

## **Food losses and trends in the development of technologies and innovative approaches**

The possibilities of reducing food losses that occur in the first stages of the food chain are largely influenced by the more sophisticated technologies used. The opposite of traditional technologies are digital technologies, which lead to increased efficiency. New plant breeding technologies, such as genome editing, are progressive compared to traditional agricultural biotechnologies, while there are concerns about their environmental and social impacts. Persistent weaknesses, such as post-harvest treatment and storage infrastructures, pose serious problems,

including food losses and waste. In this respect, new trends in agricultural development can contribute to the conservation of natural resources.

Data driven technologies are revolutionizing almost all sectors, including agriculture and food. We are witnessing a huge amount of innovation and what we know as "digital agriculture" assists in decision-making processes on farms, including the use of inputs. This involves equipping technical equipment on farms such as tractors, harvesters and other agricultural technologies with GPS systems, satellites connected by digital sensors, the use of drones, or the application of precision agriculture, which have been used in practice for many years. (Rose and Chilvers, 2018).

An increasing number of farmers, especially in industrialized countries, are increasingly using these technologies to increase the efficiency of inputs such as energy, agrochemicals, seeds, etc. In other cases, farmers use these technologies to address labour shortages, e.g. robotic milking parlour.

Farmers in less developed countries, including small farmers, are also beginning to apply digital technologies, although there is a significant knowledge gap, so much more research will be needed in this area to be able to take advantage of these trends.

These data-driven digital technologies have a major impact on food security and nutrition, although there are still conflicting discussions about this. Proponents argue that digital technologies allow farmers to make the right decisions by using computer-assisted big data analyses that can help determine the application of more optimal doses of fertilizers, pesticides and other inputs when used efficiently in their fields.

However, critics emphasize that "technology alone" cannot solve food security and warn that the growing amount of specific data that can be transferred to large private corporations providing these technologies and related services raises important data ownership issues, and their management (Bronson and Knezevic, 2016).

Another group of experts emphasizes that these technologies are not available to poorer farmers and may further accentuate inequalities between farmers in developing and industrialized countries (Moseley, 2017).

### **Environmental impacts of food waste and food losses - Food waste versus water waste**

In 2015, climate change was listed by the UN among the 17 sustainable development goals under number 13 - Climate protection. The sharp rise in global temperatures, rising global ocean levels, frequent weather fluctuations are all consequences of climate change. Water scarcity will multiply if this sustainable UN target is not at least partially met by 2030. It goes without saying that average air temperatures will affect agricultural production and lead to higher water requirements for plants. Agriculture will have to prepare for such impacts of climate change by using modern irrigation systems that, with minimal abstraction, will maximize the efficiency of the water used, so that it leads to higher plant yields. Such an approach will not save farmers from drought, but when drought comes, it will not

result in the devastating effects of hunger and a lack of healthy food and nutrition. Water consumption has doubled in the last century compared to population growth. About 4 billion people out of a total of 7.9 billion live in conditions of severe water shortage for one month a year and at least 1.6 billion has no access to tap water.

Agriculture uses on average up to 70% of fresh water supplies. In developing countries, this figure is as high as 95%. Agricultural fertilizers, pesticides and other contaminants are among the main sources of water pollution which, if not properly managed, cause significant social, economic and environmental damage.

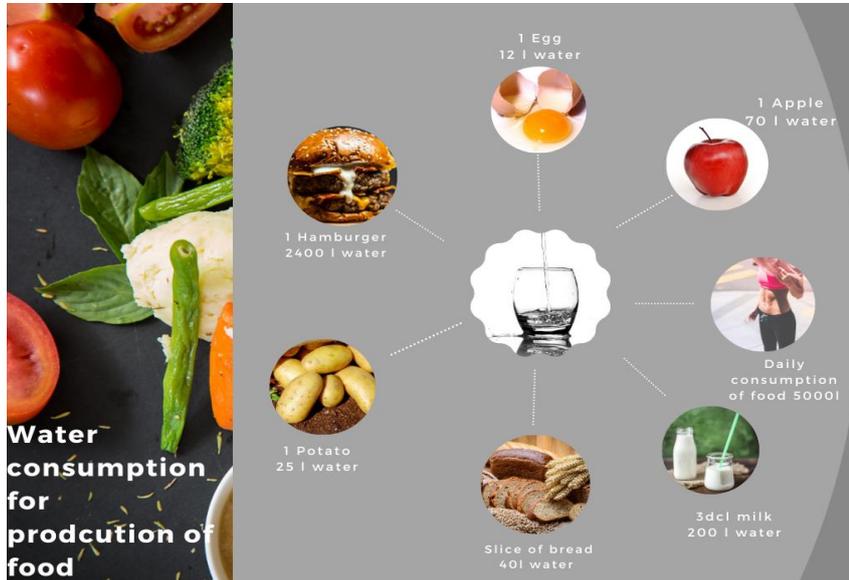
Water is essential for every form of life, for all aspects of socio-economic development and for maintaining healthy ecosystems. While, on the one hand, there are sufficient drinking water resources from a global perspective, on the other hand, further intensive development of agriculture and industry raises serious concerns in terms of the long-term use of water resources. Water scarcity is one of the world's greatest challenges today. Therefore, the issue of water has been included among the 17 sustainable goals of the UN, which are to be met by 2030. Water is listed under the Goal No. 6 Clean water and hygiene. The priority mission of this goal is to ensure the availability and sustainable management of water and sanitation for all. Achieving this goal is very challenging, especially when we realize that for 40% of people today, clean water and sanitation are not available. This goal is closely linked to the protection of healthy ecosystems - mountains, rivers and wetlands.

Although there are sufficient supplies of drinking water in the world, more and more regions, especially in the southern hemisphere, suffer from chronic shortages. On average, agriculture requires 70% of water consumption for its production processes, in developing countries it is up to 90%. Food production has increased by 100% in the last three decades. According to FAO forecasts, the volume of this food production will also need to increase by a further 60% by 2050 to meet the increased food demand of the growing human population. According to corresponding FAO research, irrigated areas are expected to support the growth of food production by 50% by 2050, but in the interests of sustainable development, only 10% more water can be used than is currently the case. This will require the introduction of the most progressive irrigation techniques, which will ensure the most efficient use of drinking water while minimizing its consumption and achieving higher yields per hectare.

The world has 1400 mil. km. cubic waters, but only 0.003% of this amazing amount (45,000 cubic kilometres) are sources of drinking water. This water is used for drinking, hygiene, agricultural and industrial production, but not all of it is ultimately used for the aforementioned purposes, due to the fact that much of this water is washed away by major floods. A huge amount of water is needed for food production. According to FAO (2009) calculations, the daily dose of food needed for one person requires 2000 to 5000 l of water. Water consumption for:

- the production of one hamburger requires 2400 l of water,
- the production of one egg requires 12 l of water,
- the production of one three-part cup of milk requires 200 l of water,
- 70 l of water is required to grow one apple,
- the production of one slice of bread requires 40 l of water,

- the production of one potato requires 25 l of water,
- the production of 1 kg of beef requires 14 000 to 15 000 l of water,
- the production of 1 kg of chicken meat requires 4 325 l of water,
- 1000 to 3000 l of water are needed to produce 1 kg of grain,
- the production of 1 kg of lentils requires 1250 l of water (Figure 2).



**Figure 2** *Water consumption for production of food*

Source: Own processing based on the data from *The future of food and agriculture. Trends and challenges*, 2017, FAO, p.114, ISBN 978-92-5-109551-5

In food production, it should be borne in mind that water is used by plants in the field by evaporation and transpiration. The amount of water consumed varies from one plant to another depending on the place where it is grown, according to the amount of precipitation, average temperatures, the type of plant, but of course also the irrigation itself. E.g. pulses have a low trace of water consumption, as already mentioned per 1 kg of lentils, only 1250 l of water are needed.

According to the FUSIONS project (2016), an estimated 100 million food wastes are generated each year in the EU-28. The global warming potential (GWP) of current food waste in the EU in 2011 is estimated at around 227 MT CO<sub>2</sub> equivalent. This is 16% of the total GWP of food use in 2011. There is a global FAO study: *Trace of food waste: impacts on natural resources*, which emphasizes that the carbon footprint of all foods produced but not consumed is at level 3, 3 G ton CO<sub>2</sub> Equivalent. If the results of this study were to be truly confirmed, then the issue of food waste would be the third largest source of emissions after the US and China (FAO, 2015). According to the FAO, food losses and food waste are also the cause of another 3.3 billion tons of greenhouse gases released into the atmosphere (FAO, 2014). Food waste has an impact on the environment, as its production leads to the

loss of valuable resources such as energy, water, soil and also to the generation of greenhouse gas emissions polluting the environment (Brancoli, 2017).

The largest carbon footprint of food waste is in total cereals with 34%, followed by meat and vegetables - both with a share of 21%. All food waste of animal origin accounts for 33% of the total carbon footprint production, although its volume in food waste is only 15% (FAO, 2013). In terms of per capita, the average carbon footprint of food waste is 500 kg CO<sub>2</sub> per year. Europe, North America, along with Oceania and the industrialized part of Asia, have the largest carbon footprint per capita per year. In these areas, the carbon footprint is approximately 700 to 900 kg of CO<sub>2</sub> per capita per year (FAO, 2013). This includes industrially developed and consumer-oriented countries. In these countries, the significant production of food waste is at the end levels of the food chain - supermarkets, catering facilities and households.

### **Use of waste for the production of alternative energy sources**

The use of waste for energy purposes is an increasingly popular topic. As food waste contains a large part of usable energy and the amount of municipal waste generated by the population is increasing every day, it is necessary to recover this waste.

At present, the issue of waste in Slovakia is regulated by the following laws:

- Act 343/2012 Coll., Amending and supplementing Act no. 223/2001 Coll. on waste

At present, waste can be handed over to:

- biogas station,
- composting plant,
- Act no. 376 of 29 November 2016 amending Act of the National Council of the Slovak Republic no. 152/1995 Coll.

On food, here in the autumn of 2016 the Ministry of Agriculture and Rural Development of the Slovak Republic enforced an amendment to the Food Act in an effort to reduce food waste, which brought the possibility of donating food to charitable organizations after the expiration date.

### **The potential of biogas and bio energy in the world**

The use of food waste would help solve global problems, for example by producing biogas. In Slovakia, about 1.5 million tons of municipal waste is produced annually, of which about 400,000 tons are organic waste, which is suitable for biogas production (RES, 2015). Compared to global municipal waste production, which is 1.3 billion tonnes per year and is expected to double to 2.6 billion tonnes by 2025 (Worldwatch Institute, 2012). Currently, the most widespread supported biofuels - biodiesel and bioethanol. Biodiesel is produced mainly from vegetable oils and bioethanol from various cereals and sugar beets. These energy crops for biofuel production need to be grown on a specific area, which means that they are dependent on arable land and in some extreme cases this can lead to undesirable deforestation.

The importance of these biofuels is growing worldwide and measures have been taken within the EU to promote them in order to reduce greenhouse gas emissions and promote cleaner transport. However, the truth is that biofuels contributed in part to the global food crisis in 2006-2009, it is estimated that they are responsible for 30% to 75% of the increase in food prices during this period (Glopolis, 2011). Biomethane or purified biogas remains an underappreciated biofuel. Biomethane has the lowest greenhouse gas emissions and the lowest energy consumption in the entire life cycle compared to other common biofuels and is produced from biomass (RES, 2015). The advantage is that biogas production is a relatively fast process. It can be used as other gaseous fuels. Unlike fossil fuels, biogas has a positive environmental impact on the environment. Careful handling does not damage the environment and it is therefore possible to create friendly conditions in the relationship between energy and the environment (EkoBonus, How do biogas plants work? An example of an interesting solution from Třeboň, 2011). Material suitable for biogas production is organic matter, which is mostly found in agriculture, the food sector or in the breeding of livestock. There, a large amount of biological waste is generated, which can be used very efficiently to produce biogas. It is also used as a source of electricity, heat or as a fuel in transport. In addition, a secondary product in biogas production is an environmentally friendly substance (so-called digestate), which serves as a high-quality fertilizer in agriculture (EkoBonus, How do biogas plants work? An example of an interesting solution from Třeboň, 2011). Biogas is created by a natural process, which creates the formation of gases - biogas from organic matter without the supply of oxygen, due to the action of bacteria, yeast or fungi. In the wild, biogas is commonly produced at the bottom of lakes or in peatlands. The gas mixture formed consists of about two thirds of methane (known as the main component of natural gas) and one third of CO<sup>2</sup> (CZ Biom, 2009). Basically, wherever there are people and the production of plant and animal production, there are conditions for the production of biogas.

## Discussion

Food systems with food supply chains have changed significantly in recent decades and are characterized in particular by the growing distance between producer and consumer as food chains become more global. Approximately 20 to 25% of world food production is sold on international markets (D'Odorico et al., 2014). The value of the global food market has increased from 315 billion USD in 1991 to approximately 1.5 trillion in 2017 (WTO, 2018). Low- to middle-income countries accounted for about one-third of this figure.

In addition to this context, there is much debate that large-scale food-exporting countries are severely affected by the overloading of their ecosystems, in particular the impact on soil ecology. At the same time, it is argued that it is more appropriate to redistribute the environmental impacts of food production, so that there are no serious environmental encounters in the countries that export the most food. (Balogh and Jambor, 2020). In other words, the production and socio - economic conditions of developing countries need to be regulated to produce more of their own food.

The biggest current environmental problems in Slovakia can be considered the issue of climate change, waste management, air quality and protection of habitats and species, especially in forest, meadow and wetland ecosystems (Green Strategy, 2019). Another serious challenge is the risk of biodiversity loss, which has been going on for a long time, but a significant threat is only now occurring. According to the FAO, about 75% of the loss of world plant diversity occurred in 1900 and 2000, with the largest decline around 1950. It is explained that this loss of biodiversity is due to the expansion of monoculture agriculture. The three cereals account for more than 40% of the world's caloric intake, making food diets more homogeneous (Khoury et al., 2014). 2000 breeds of domestic animals are also at risk.

## Conclusion

Climate change is affecting agriculture, including lower yields and productivity, drought and water scarcity, extreme temperature stresses, lower forest productivity, weed growth and new diseases caused by viruses and foodborne diseases. All this leads to rising prices, has a negative impact on health, food security and nutrition. Increasing weather variability and natural disasters associated with climate change have multiplier effects on agricultural production, which significantly affects food trade and food consumption. While, on the one hand, food systems are affected by climate change, on the other hand, agriculture is the second largest economic polluter of greenhouse gases after the energy sector. The FAO estimates that agriculture, forestry and land use change generate one-fifth of GHG emissions. The share of food systems in global emissions is even higher due to the use of agrochemicals, cattle breeding, transport, storage, as well as processing and trade. Incorporating sustainability into the concept of food security is logical, as trends such as climate change, degradation of natural resources, as well as increasing social and economic inequality, reduce the future capacity of ecological systems to face such confrontations in the production of diverse and healthy food. It is therefore imperative of this time to ensure the cooperation of social and economic systems through regenerative methods of agricultural production, which ensure long-term food security and nutrition.

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# THE INTERNATIONALIZATION OF THE BUSINESS ACTIVITIES FROM THE POINT OF VIEW OF THE CORPORATE SOCIAL RESPONSIBILITY

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## Abstract:

**Purpose:** The main attention of the submitted abstract is pay to the evaluation of the internationalization of the business activities from the point of view of the Corporate Social Responsibility (CSR) in selected company. We have been determined the partial goals to achieve the main goal as well as the hypothesis.

**Design/methodology/approach:** The primary and secondary data were used. In the first part of the article, we are focused on the analysis of the term corporate social responsibility and related concepts. We set the objectives and used methodology. Second, practical part is dealing with evaluation established hypothesis and questionnaire survey, which was filled in by the sample of the company's employees. At the end we summarize the obtained data and findings and based on that, we can express our opinion and recommendations for the future development. The questionnaire was anonymous and was performed on a sample of 50 respondents. We used method of analysis, deduction and method of chi-square contingency test. It is a non-parametrical test by which we can verify the representativeness of the selected sample. The main part of this article includes the description of the questionnaire evaluation and statistical evaluation of our three set research hypotheses. In conclusion, we evaluate the overall results of our practical research and propose recommendations for the future.

**Findings:** The results show that the CSR in relation to the internationalization of the business and assessment has affected the behaviour of company, stakeholders and employees.

**Research limitations:** There are no limitations in our research.

**Practical implications:** There are some recommendations for further practical application of results like the teambuilding activities, corporate events, cooperation with environmental organisations, continuous innovation and implementation of new environmentally friendly production methods and cooperation with environmental organisations for the knowledge transfer to the raise of an awareness about the good practises of the company.

**Social implications:** Based on obtained results, it depends on the perception of the CSR from internal and external sides of company.

**Keywords:** Corporate Social Responsibility (CSR), international management, company, internationalization, stakeholders

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## Introduction

The corporate social responsibility of firms, trying to enter new markets and internationalize their production, is a hot topic, nowadays. Decision makers are solving issues connected to the profit maximization, quality improvement, lowering costs, outsourcing, resources recovery, and satisfaction of stakeholders. Companies, operating on more than one markets, have to adapt their production processes and management to the requirements of the several markets. International employees are more than a common thing in multinational corporations and managers have to respond to the constant changes caused by implementation of new technologies and innovations. In the era of a spread of technologies, the term internationalisation is commonly used in all kinds of business and services. Firms can ensure their future development by getting the knowledge about international activities, innovations and strategies of foreign firms. Globalisation is a next stage of internationalisation. An output of the corporate and industrial globalisation is an increase of an amount of multinational companies. More and more companies, dealing with similar production, are appearing on the market. To beat the competition, firms have to build up a competitive advantage. This is the aim of the management. Managers are responsible for activities within the firm such as planning, organising and controlling. Companies are outsourcing their production, hiring foreign specialists, franchising and licensing, entering new markets and so on. They are dealing with different cultures, behaviour, communication, values, languages, processes, strategies and methods of business. The concept of social responsibility is currently becoming more and more an integral part of the activities of many companies. The very name of the concept speaks about its content. Concept of social responsibility had been rising yet in the beginning of 20<sup>th</sup> Century and it gradually developed and started to be viewed as an effort of influence of the company's activities to the society. Previously corporations followed up and provided exclusively economical goals. The idea of CSR has been established by Bowen, who is considered as the first theoretician of CSR. In his book "Social Responsibilities of the Businessman" from 1953, he wrote: "*Social responsibility presents an obligation of the entrepreneurs who strive for the strategies, make the decisions or perform the actions, which are required by the point of view of the goals and values of our society*". According to this theory, the goal of a producer was not the best available satisfaction of the customers, but even the whole society (Bowen, 1953). It means, that it is necessary to take into consideration the relations between CSR and internationalization of business activities. From this point of view, the main objectives of submitted paper is to evaluate the corporate social responsibility of company regarding to the globalisation and internationalisation of the business and assess the influence of the corporate social responsibility of the entity on the stakeholders. The publication of this article is supported by the Slovak Agency KEGA - Project KEGA 005SPU-4/2019 "Theory and Practice of the International

Management and Entrepreneurship in Multicultural Environment”, which is solved at the Department of Management in Poprad (co-researcher workplace), Faculty of Education, Catholic University in Ruzomberok.

### Literature review

In the last decades, corporate social responsibility (CSR) issues have received an increasing attention, with academics, media, civil society, and, more recently, even politicians and regulators emphasizing the importance of CSR. Economists and management scholars, as well as business ethicists, have debated the meaning of CSR, its implementations, and its performance measurement (Gatti et al. 2019, p.961). CSR presents conception that moves not only individual organizations and companies to the sustainable development, but also whole country, it connects its economic development with social inclusion, environmental carrying capacity and institutional quality. In last period there is given more attention to creation of conditions for CSR, mainly not only at the level of individual firms, but also at the level of whole countries, and it becomes strategic priority of government in many states (Antošová, Csikósová, 2013), (Madzík, Budaj, Chocholáková, 2018, p.5). Experts offer also today various interpretation of definition of “Corporate Social Responsibility“, but all of them are leaning on principle of neutrality, transparency, engaging and active cooperation with interesting subjects. Several published opinions, processed (Bussard et al. 2005) and (Bylok, 2016, p. 19). Its evaluation in developed countries is integral part of evaluation success in social and economic development. Individual aspects of CSR are communicated not only with expert public, but they become subject of interest of whole society. Acquiring of CSR principles by inhabitants is viewed as decisive base that increase quality of life in the country. On the other, the strong relation between CSR within its three pillars and sustainable development from the viewpoint of agricultural enterprises is explained by (Juríčková et al., 2020, p.2020). Idea Corporate Social Responsibility is not very expressly limited, expert literature provides various interpretation of its definition, which base on the objective principle, involvement, active cooperation with interested subjects and transparency. They are marked with common characteristics, for example universality, spontaneity, and they are orientated to the active cooperation of every interested party with aim to express obligation to the development of quality of life. The most significant critic of CSR was Milton Friedman, who emphasized in his article “*The Social Responsibility of Business is to Increase its Profits*” (1970) that if a profit is the only goal, it is logical that every profit decreases, even though for the purpose of philanthropy, reduces the value itself. Thanks to his opinions, the second half of the 20th century is characteristic by the effort to maximize the profit. The main argument against the Friedman’s criticism of responsible entrepreneurship is the theory of stakeholders introduced by Freeman. It is based on the idea that we shouldn’t consider just the owners, but even

other stakeholders, such as employees, customers, suppliers or the society (Bosch-Badia et al., 2013, p.12).

## Methodology

The aim of this paper is to evaluate a corporate social responsibility of the company regarding to the globalisation and internationalisation of the business and assess the influence of the corporate social responsibility of the entity on the stakeholders. The research was conducted in February, 2021 attended by 50 respondents from the company. While processing the paper the following hypotheses were formulated:

H<sub>1</sub>: We assume that the perception of the corporate social responsibility depends on the financial situation of the company.

H<sub>2</sub>: We assume that the perception of the ethical principles of the trade is effected by business activities of company.

H<sub>3</sub>: We assume that it is demonstrable that the parent company has more developed perception of the corporate social responsibility than the subsidiaries according to the wider range of resources.

For the evaluation of hypothesis we used method of chi-squar contingency test. It is a non-parametrical test by which we can verify the representativeness of the selected sample.

To detect dependencies between the obtained values we used chi-square test of square contingency with a significance level  $\alpha=0,05$ . (Matejková, Pietriková, Poláková, 2013). The formula for calculation of the tested criterion is:

$$\chi^2 = \sum_{i=1}^m \sum_{j=1}^k \frac{(E_{ij} - T_{ij})^2}{T_{ij}} = \frac{((a_i b_j) - (a_i b_j)_0)^2}{(a_i b_j)_0}$$

Where:

m- the number of categories of the first character

k- the number of categories of the second character

E<sub>ij</sub>- empirical frequency of the i-th row and j-th column

T<sub>ij</sub>- theoretical frequency of the i-th row and j-th column

When the calculated value is lower than the critical value, there is no statistical dependence between the characters.

## Results and Discussion

The survey of the social responsibility in company was conducted through the questionnaire in the selected branch office of the company, whereby we can get as much information and opinions as possible from employees about the socially responsible conduct of the business. Other authors present a broad approach to Corporate Social Responsibility (CSR), which aggregates a diversity of issues, such as the environment, labor conditions, and human rights. We addressed the impact of increasing CSR demands during the internationalization of emerging market multinationals (Reis, Molento, 2019, p. 351). This survey consists of 11 questions, and it is anonymous. The best possible assessment of the issue in the company required, that the survey involved a large sample of respondents. This survey was conducted on a sample of 50 respondents of different age, gender and qualification structure. From all 50 respondents there were 29 women and 21 men. The perception of the corporate social responsibility could be influenced by the number of employees in the operation. The studied entity is taken as a medium enterprise and it has currently 220 employees from which around 65 % are women. The operations have some foreign managers and employees, but mostly the staff is formed by local workers from the region. According to respondents, the enterprise is having very good relations with its shareholders, suppliers, and business partners. Mostly those are loyal, long-lasting partners, that is why the results were so positive. The 46,9 % of respondents think that managers of the company are giving a strong effort to keep the positive relations with their stakeholders. Each company wants to ensure profit and it depends on the turnover. With financial situation in firms, including dairy industry deals Esmerino et al. (2017). That is why the positive relations are so important. Each business activity must be reconciled with the ethical principles of trade. To be a part of the European Union, businesses must respect the rules and principles of fair trade. The following question was determined as a hypothesis. In the terms of the environmental policy, the company is using environmentally friendly work practices according to the EU regulations. In the terms of the environmental policy, the company is using environmentally friendly work practices according to the EU regulations. We can gladly say, that more than 93 % of respondents think that the waste policy of the company is enough. Protecting the environment is beneficial for the nature, humans and the enterprises also. The company is operating almost all around the world. Each country has specific trade conditions, but in the era of globalization, governments are trying to protect more and more the natural environment. According to the 78 % of questionnaire respondents, the company is dealing with this case on the high level, but since the creation of this branch office, the PR management did not have time for organization of special events to support the environmental protection. The company is trying to protect the environment by implementation of environmentally friendly practices and techniques. The headquarters is investing a lot to the research and development.

One part of this huge investment is a research and development in the field of environmental protection. This also includes recycling processes, transport optimization, and energy and water savings. According to the survey, around 90 % of respondents say that company is purchasing environmentally friendly machinery and equipment. In spite of the fact, that problem of CSR is very worldwide, it gets slowly into awareness in Slovakia. More and more Slovak companies incorporate CSR principles into their practice and learn to profit from its implementation (Ubrežiová, Kozáková, Malejčíková, 2015, p. 542).

### **Evaluation of hypothesis**

**H<sub>1</sub>:** We assume that the perception of the corporate social responsibility depends on the financial situation of the company. According to our calculation we came to the result that perception of CSR depends on the financial situation of the company because in that case the company has more financial tools to make CSR. Our result is based on the fact that Chi-square test of a square contingency equals to  $\chi^2 = 3,824$  and the critical value is 2,159.

**H<sub>2</sub>:** We assume that the perception of the ethical principles of the trade is effected by business activities of company. Based on the assumption that there is a dependence between the perception of the CSR and the ethical principles of the trade, we prepared the Chi-square test of a square contingency and calculated  $\chi^2$  and the critical value. Our hypothesis was confirmed and we can say that there is statistical dependence. The results were  $\chi^2 = 2,562$  and the critical value equals 2,128. This may be due to the fact that the company focuses on the CSR, the more it cares about the ethical principles of the trade.

**H<sub>3</sub>:** We assume that it is demonstrable that the parent company has more developed perception of the corporate social responsibility than the subsidiaries according to the wider range of resources. To find out the dependence between parent company and the daughter company and their perception of the corporate social responsibility we used Chi-square test of a square contingency.  $\chi^2 = 2,835$  and the critical value is 3,841. Based on the results of the analysis we can say that between the characters parent-daughter company and their level of the perception of the CSR there is no statistical dependence. But according to the answers in the survey, most of the respondents said that the mother company is more focused on the corporate social responsibility and it does more according to it.

## Conclusion

Corporate social responsibility is an obligation of each enterprise, which is operating with respect to the environment, society and the economy. Evaluation of the hypotheses showed us, that there were slight deviations between the critical values and calculated values. In our case, we found out that the perception of CSR depends on the financial situation of the company because in that case the company has more financial tools to make CSR, there is a dependence between the perception of the CSR and the ethical principles of the trade, and between the characters parent-daughter company and their level of the perception of the CSR there is no statistical dependence, but according to the answers in the survey, most of the respondents said that the mother company is more focused on the corporate social responsibility and it does more towards it. We can give some recommendations for the future development of the company's perception of the corporate social responsibility and these could be regarding to the business activities that the company could offer some trainings to prepare the employees more on the changes and innovations, to support the community, management of the company can organize some sport events or barbecues to create a relationship with neighbors and potential future employees. Continuous innovation and implementation of new environmentally friendly production methods and cooperation with environmental organizations for the knowledge transfer can contribute to the raise of an awareness about the good practices of the company. Very important is to keep good relationships with regular customers and also attracting the new possible ones by implementation of innovative customer care and production.

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## **SECTION 2:**

### **Business strategies, Planning and Management**

## BOARD OF DIRECTORS & TOP MANAGEMENT TEAM GENDER DIVERSITY IN EUROPEAN COMPANIES

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### Abstract

**Purpose:** In recent years, corporate social responsibility (CSR) has become a strategic issue for many companies, which do not hesitate to invest a lot of their resources into this concept in order to do their businesses alongside with the positive influence on the society they are part of. One of the areas where the legacy of CSR is continuously increasing is also human resources management (HRM). As a result, diversity, and inclusion together with gender and racial equal career opportunities are areas, which are now very often part of official goals especially of international corporations. The focus of our paper is on gender diversity and equal career opportunities as part of CSR activities in HRM. Using data about 247 large European companies we analyse board of directors and top management team gender diversity. In more details, we review gender diversity of positions within top management and identify leadership roles with highest share of women representatives. We also evaluate leadership gender diversity from different aspects like country, industry, ownership structure, year of the establishment and other. Based on the results we propose a hypothetical profile of ideal company, in which the career growth of women and their chances to become member of board of directors or top management team should not be limited by any type of gender discrimination or prejudice.

**Design/methodology/approach:** Data used in this research were retrieved from TP Catalyst Database. To analyse raw downloaded data, data-mining methods like classification, clustering and summarization were used. To identify leadership gender diversity structure, percentage of male and female representatives within board of directors and top management team was calculated. Results were then sorted, ranked, and compared using selected criteria like country, business activity, ownership structure, year of the establishment and other.

**Findings:** This study provides valuable information for company and government decision makers about board and top management gender diversity and equal career opportunities from the perspective of CSR activities in HRM within large European companies. Identified are countries, industries, and other company characteristics with the highest share of women representatives within company leadership roles.

**Research limitations:** This study does not analyse the impact of external factors like legislation, incentives, regulation, etc. on company leadership gender diversity and on CSR activities in HRM, which could be the focus of the future research.

**Practical implications:** The paper supports the notion that gender diversity is an important corporate governance issue. If firms wish to provide correct signals regarding board independence and effectiveness, they should also consider some of the qualitative aspects such as gender diversity. The gender diversity might even act as a substitute for board independence.

**Social implications:** Acknowledging the role of women in corporate governance best practices can potentially increase the effectiveness of independent directors as it decreases the negative signal of an unbalanced gender board. Female directors send a positive signal to the public regarding a firm's ethical behaviour towards the society they are part of.

**Keywords:** gender, diversity, company, management, leadership

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## Introduction

In the current socio-economic environment, increasing number of companies realize the importance of corporate social responsibility (CSR). One of the areas where the legacy of CSR is continuously increasing is also human resources management (HRM). It is a topic especially for big multicultural corporations, that have recognized their employees as one of the most important assets the company can have and therefore, they have set up diversity and inclusion, together with gender and racial equal career opportunities as part of their official goals.

The focus of this study is on gender diversity and equal career opportunities as a part of CSR activities in HRM. We analyse board and top management team gender diversity and identify leadership roles within top management with highest share of women representatives. We also evaluate leadership gender diversity from different company characteristics perspective. Based on the results we propose a hypothetical profile of ideal company, in which the career growth of women and their chances to become a member of leadership team should not be limited by any type of gender discrimination or prejudice.

This study provides valuable information for company and government decision makers about board and top management gender diversity and equal career opportunities from the perspective of CSR activities in HRM. According to various studies, gender leadership diversity seems to be an important factor in improving of the social and environmental performance of companies. The presence of women indicates that boards are more likely to make strategic decisions aimed at improving information transparency regarding CSR. Female directors send a positive signal to the public regarding a firm's ethical behaviour towards the society they are part of. However, the results of our study indicate the existence of persistent dominance of male leaders within large European companies.

## Literature review / Research background

The issue of gender diversity on the labour market on different levels has earned a significant attention during the last years. Even though it is a frequently debated topic, there are several research articles that prove the poor representation of women at leadership positions (e.g., Patel et al. 2020, p. 1; Ghaleb et al. 2021, p. 6; Capers et al. 2021, p. 3). Potvin et al. (2018, p. 5) confirmed that in cultures with smaller board sizes and more females in leadership positions, the board representation of women is higher. In fact, the share of women leaders and their effect on the company's performance depends on the country, industry, or socio-economic factors (Hedija, Němec 2021, p. 159).

Diversity and the presence of women has various benefits on the leadership team, such as better problem-solving tools, more effective solutions, and broader thinking (Reddy, Adhikari, Chitranski 2017, p. 40). Furthermore, companies that support diversity, e.g., employ more women directors tend to create far-seeing and integral CSR board strategy, that has the potential to develop superior environmental and social performance of the company (Shaukat, Qiu, Trojanowski 2016, p. 569). Also,

Nielsen and Huse (2010, p. 13) demonstrated in their theories that women on boards are more likely to support others, accept new ideas, help to solve relational and interpersonal issues.

In general, typical leadership traits are more preferably associated with men than women, which besides other negative stereotypes associated with women, could keep women from the election for leadership positions (Sczesny et al. 2004, p. 632). On the other hand, men are considered as independent, dominant, result- and task-oriented, that explains why men work more often at leader positions as women (Tannen 1991, p. 158).

Since the importance of CSR is more and more recognized by various societies, businesses' efforts of CSR activities are noticeable also by employees who are looking for a new job, that also leads to consumer behaviour change and in the case of companies that ignore CSR provokes poor reputation (Feng, Groh, Wang 2020, p.1). Multinational corporations have recognized that their employees are one of the most important stakeholders in social responsibility. Encouragement of personnel advancement in the company's hierarchy, as well as promotion of women in leadership positions, are two key priorities for these businesses. Simultaneously, the companies in a survey expressed a positive interest in diversification (Obrad, Gherhes 2018, p. 13).

## **Methodology**

Based on the scope of our research, defined diversity dimensions and company characteristics, we set criteria for downloading the data from TP Catalyst database about companies that are analysed in this study. Because of the large volume of data, that each downloaded company profile from the database contained, we performed screening, pre-processing, and clustering of raw downloaded data, so they could be effectively used in the following stages of the research. Using already pre-processed downloaded data, we quantified board and top management gender diversity structure of companies (including top management positions) and classified companies within defined company characteristics. For classification of companies within company characteristics we either used categorization directly from the database or using information about companies from the database we performed our own categorization. As the next step, we did a ranking of companies based on the average board and top management female representatives % within each defined company characteristics. Based on the results of the ranking within each company characteristics criteria, we proposed hypothetical profile of ideal company and specific top management position where female career grow should not be limited by gender prejudice or stereotypes. As the last step we did summarization of results, draw conclusions, and identified limitations of the research.

Data for this research were downloaded from TP Catalyst database during December 2020. TP Catalyst is an online database used mainly for arm's-length benchmarking analysis. It contains extensive corporate ownership data including global coverage of companies around the globe, with detailed financials (Bureau van Dijk 2020). For the purpose of this research, we were able to process data about

247 companies from 19 European countries. Countries in the scope were selected randomly to represent each geographical part of Europe. We focused only on very large companies (with over 100 employees), because companies of this size, in most of the countries, usually have regulatory obligation to publish information about their leadership representatives, which is the key input for this research. We also did not limit the selection of companies to any industry type or economy sector to get as comprehensive overview of results as possible, given the sample size. Based on the list of company leadership representatives, we identified for each company total number of board and top management male and female representatives. Consequently, we were able to quantify percentage of male and female representatives within Board of Directors and Top Management team. Using this approach, we also identified gender diversity structure of each Top Management position. In our study we analysed board and top management diversity structure from the point of view of eight selected company characteristics (*Europe Geo. Region, Years on the Market, Public/Private, Family Business, Ownership Capital Origin, Ownership Capital Origin Country Economy, Business Activity, Economy Sector*). Downloaded data from TP Catalyst database were used to classify all companies in our scope into specific categories within above mentioned company characteristics.

Using information about company country of residence, we classified companies into *Europe Geo. Region* categories (Annex A). Company date of incorporation was used for categorization of companies within *Years on the Market* criteria. For classification of companies within *Public/Private* and *Business Activity* characteristics was leveraged categorization available directly in the database. Information from database about company owner was used to categorize companies within *Family Business* characteristic. By comparing the residence country of the company owner and the residence country of the company, companies were classified into *Ownership Capital Origin* categories. Leveraging World Bank country classification by GNI per capita (World Bank 2021) and country of the company owner information from the database, companies were categorized within *Ownership Capital Origin Country Economy* characteristic (Annex B). Using NACE Rev. 2 main section company information from database, companies were categorized into *Economy Sector* characteristic (Annex C).

## Results and discussion

Research was performed on the sample of 247 large companies from Europe. Most of the companies (51.4%) were from Western Europe while least companies were from Central and Southern regions with less than 10% representation. In the sample were more private (51.4%) than public companies (47.4%). From years on the market perspective, most companies (43.3%) were on the market from 6 to 10 years while considering the limitation that figures within this company characteristic were not reflecting full history of the company, if the company went through restructuring, old company was liquidated and new one was set up. Only 17.4% of companies could be classified as family business comparing to 81%, which

were not. More than 50% of all companies were from tertiary sector while the smaller half was all together from primary, secondary and quaternary sector. Most of the companies (47.4%) were doing business in Services and least (16.2%) in Wholesale & Retail. Domestic ownership capital had 75.3% of the companies comparing to only 21.9% companies with the foreign ownership capital. In case of 81.4% of the companies the ownership capital came from high-income economies followed by the ownership capital from middle-income economies (15.4%) and only one company (representing 0.4%) had ownership capital from low-income economy (Table 1).

**Table 1. Characteristics of the research sample**

Europe Geo. Region	%	Public / Private	%	Ownership capital origin country economy	%
Central	9.7	Private	51.4	High-income economies	81.4
Eastern	15.4	Publicly quoted	47.4	Middle-income economies	15.4
Nordics	14.6	Formerly publicly quoted	1.2*	Low-income economies	0.4*
Southern	8.9	Family Business	%	n.a.	2.8*
Western	51.4	No	81.0	Business Activity	%
Years on the market	%	Yes	17.4	Services	47.4
1 - 5	19.0	n.a.	1.6*	Manufacturing	36.4
6 - 10	43.3	Economy Sector	%	Wholesale & Retail	16.2
11 - 20	17.0	Primary	3.6	Ownership Capital Origin	%
20 +	20.6	Secondary	32.8	Domestic	75.3
		Tertiary	50.2	Foreign	21.9
		Quaternary	13.4	n.a.	2.8*

\* Excluded values due to not available data or insufficient sample size.

Source: own research

Using calculated average board and top management female percentage, we ranked companies within each selected company characteristics (*Europe Geo. Region, Years on the Market, Public/Private, Family Business, Ownership Capital Origin, Ownership Capital Origin Country Economy, Business Activity, Economy Sector*). Higher average Board or Top Management female %, equals to higher ranking of the company within specific criteria. Results of companies' leadership gender diversity ranking from the perspective of each analysed company characteristics are shown in Table 2. Top Management position with the highest female representatives is Administration department with 52% of female representatives, followed by Human Resources with 50% of female representatives. Least women within Top Management are working on the Operations & Production & Manufacturing department (only 6%).

**Table 2. Ranking of companies based on Board and Top Management avg. female %**

Company Characteristics	Category	Board		Top Management	
		Avg Female %	Ranking	Avg Female %	Ranking
Europe Geo. Region	Eastern	24*	1	22*	1
	Southern	24*	2	17*	4
	Nordics	23	3	22*	2
	Central	16	4	15	5
	Western	14	5	17*	3
Years on the Market	11 - 20	22	1	20*	3
	1 - 5	21	2	20*	2
	20 +	19	3	22	1
	6 - 10	14	4	15	4
Public / Private	Publicly quoted	23	1	21	1
	Private	13	2	16	2
Family Business	No	18	1	18*	1
	Yes	16	2	18*	2
Ownership Capital Origin	Domestic	20	1	20	1
	Foreign	11	2	15	2
Ownership capital origin country economy	High-income	18*	1	18	2
	Middle-income	18*	2	23	1
Business Activity	Wholesale & Retail	20	1	20*	2
	Manufacturing	18	2	15	3
	Services	17	3	20*	1
Economy Sector	Tertiary	19*	1	21	1
	Secondary	19*	2	16	2
	Primary	15	3	14	4
	Quaternary	11	4	15	3

\* In case more categories had equal avg. board or top management female %, higher ranking was assigned to category with the larger sample size.

Source: own research

Based on the results of the above-mentioned ranking, we proposed hypothetical profile of ideal company (Table 3) and specific top management position where female career grow should not be limited by gender prejudice or stereotypes. Using Board average female %, the ideal company could be described as publicly quoted company from Eastern Europe with domestic ownership capital from high-income country economy. This company is on the market up to two decades. It is not family-owned company, doing business in wholesale & retail and belonging to tertiary sector of economy. From Top Management perspective, the ideal company is as well not family owned publicly quoted company from Eastern Europe. It has domestic ownership capital from middle income economy. This company is doing business in services for more than two decades and belongs to tertiary sector of economy.

As ideal top management position for women we propose and recommend Human Resources department (50% of female representatives) over Administration (52%) due to larger sample size (33 female representatives were identified within 43 companies in case of HR department vs. only 7 female representatives within 12 companies in case of Administration department).

**Table 3. Ideal company hypothetical profile proposal based on avg. board and avg. top management female %**

Company Characteristic	Board		Top Management	
	Top Ranking Category	Avg Female %	Top Ranking Category	Avg Female %
Europe Geo. Region	Eastern	24.1	Eastern	21.7
Years on the market	11 - 20	22.5	20 +	21.6
Public / Private	Publicly quoted	23.0	Publicly quoted	20.9
Family Business	No	18.2	No	18.3
Ownership Capital Origin	Domestic	19.9	Domestic	19.5
Ownership Capital Origin Country Economy	High-income economies	18.0	Middle-income economies	22.7
Business Activity	Wholesale & Retail	20.1	Services	19.6
Economy Sector	Tertiary	18.8	Tertiary	20.9

Source: own research

Results of our research are signalling persistent dominance of male leaders within large European companies. Total average Board and Top Management female representation is only 18% while 44% of analysed companies does not have any female representative in the Board and 38% of companies from our sample have no female representative in Top Management. Only 10 % of analysed companies have equal or more female Board or Top Management members than male members. Similar results as our research have several other studies that also indicate low female representatives on leadership positions (e.g., Patel et al. 2020, p. 1; Ghaleb et al. 2021, p. 6; Capers et al. 2021, p. 3). Study performed by Potvin et al. (2018, p. 5) was more specific regarding its results as it confirms that board female representation is higher in companies with smaller Board sizes.

## Conclusion

This study provides valuable information for company and government decision makers about board and top management gender diversity and equal career opportunities from the perspective of CSR activities in HRM within large European companies. Various studies suggest that gender diversity enhances the corporate governance mechanisms. It also appears to be an important factor in improving of the social and environmental performance of companies. The presence of women indicates that boards of directors are more likely to make strategic decisions aimed at improving information transparency regarding CSR. Furthermore, acknowledging the role of women in corporate governance best practices can potentially increase the effectiveness of independent directors as it decreases the negative signal of an

unbalanced gender board. Female directors send a positive signal to the public regarding a firm's ethical behaviour towards the society they are part of.

However, the results of our study hint on the existence of persistent dominance of male leaders within large European companies. The average Board and Top Management female representation in the research sample is below 20% and more than 50% of analysed companies have no female representative in the Board. Only 10% of analysed companies have an equal or higher representation of female leaders when comparing to male.

There are also several limitations to this study. The paper does not analyse the impact of external factors like legislation, incentives, regulation, etc. on company leadership gender diversity and on CSR activities in HRM, which could also be the focus of the future research, as do the potential reasons behind current status.

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## Annexes

### *Annex A. Classification of companies within Europe Geo. Region company characteristic*

Region	Countries
Nordics	Finland, Sweden
Central	Germany, Poland, Switzerland
Southern	Greece, Italy, Portugal, Spain
Western	France, Ireland, Netherlands, United Kingdom
Eastern	Croatia, Israel, Romania, Russian Federation, Turkey, Ukraine

Source: own research

### *Annex B. Classification of companies within Ownership Capital Origin Country Economy company characteristic*

Country Economy	Country
High-income	Australia, Austria, Bermuda, British Virgin Islands, Cayman Islands, Croatia, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Poland, Portugal, Romania, Seychelles, Spain, Sweden, Switzerland, United Kingdom, United States
Middle-income	Brazil, China, Russian Federation, Turkey, Ukraine
Low-income	Liberia

Source: own research based on World Bank country classification by GNI per capita

### *Annex C. Classification of companies within Economy Sector company characteristic*

Economy Sector	NACE Rev. 2 categorization of companies
Primary	A - Agriculture, forestry and fishing; B - Mining and quarrying
Secondary	C - Manufacturing; D - Electricity, gas, steam and air conditioning supply; F - Construction
Tertiary	G - Wholesale and retail trade, repair of motor vehicles and motorcycles; H - Transportation and storage; I - Accommodation and food service activities; J - Information and communication; K - Financial and insurance activities; L - Real estate activities; N - Administrative and support service activities; O - Public administration and defence, compulsory social security; Q - Human health and social work activities; R - Arts, entertainment and recreation; S - Other service activities
Quaternary	M - Professional, scientific and technical activities

Source: own research based on TP Catalyst data

# CONCEPT OF TALENT MANAGEMENT IN ENTERPRISES OF SLOVAKIA: FACTORS INFLUENCING STRENGTHS AND WEAKNESSES

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## Abstract

**Purpose:** As a result of the dynamic environment and changes the concept of talent management has become very important topic in business organizations today. Company with talent management should meet better economic results. Talent management in business environment integrates strategy of the company, HR strategy, identification and recruitment, assessment, development, and retaining talents into complex process. Main objective of this research is to explore the current state of the concept of talent management realized in all phases of talent management in companies operating in Slovakia. According to the results main strengths and weaknesses are identified in the process of talent management.

**Design/methodology/approach:** Paper is focused on the factors of talent management process such a foreign capital, size of the company, economic situation, ownership, and existence of the HR department. A scaled questionnaire used in previous researches was used as a tool for data collection in 381 companies operating in Slovakia. Questionnaire reliability was verified by Cronbach's alpha and reached the level 0.799. To verify the existence of statistically significant differences between individual groups of respondents the Kruskal-Wallis test and Mann-Whitney U test were used.

**Findings:** We found that foreign capital, economic results, and the existence of HR department are very significant factors influencing the level of talent management process in enterprises. Identification of strengths and weaknesses in talent management process were used for suggestions to meet higher level of the processes in management of searched companies.

**Research limitations:** Research should be extended to more companies to meet the requirements of representative sample. Results should be compared with other similar researches in other countries worldwide.

**Practical implications:** Each company can use self-evaluation of talent management according to the issues used in questionnaire. Main strengths should be used as a basic stone for personal strategy in companies. Enterprises should avoid mistakes of several companies that lead to weaknesses in the organizations because they have negative impact on economic results and development.

**Key words:** talent, management, process, strength, weakness

## Introduction

Zero waste management can also be used in human resource management. The more talented a company has, the better results can be achieved in the field of zero waste management. Businesses are interested in people bringing new blood in the form of innovative original ideas. People who perform well while trying to move

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forward, develop themselves, but also the business. Employees who significantly influence the direction of the company and determine its success. They're the people we call talent. If we have people like that on the team, there is a presumption that we will outperform our rivals in the market and achieve satisfactory economic results.

It is therefore a necessity for any company to be able to manage talent. A good guide seems to be a system of talent management, which must be integrated into the company. It is a process that begins with a strategy, where the top management of the company clearly declares that employees are the most important source of the company and a strategic element on which to build the future long-term success of the company. The human resources strategy, with an emphasis on talent support and its consistency with business and business strategy, is the cornerstone on which an integrated talent management process can be built, starting with the identification and acquisition of talent, continuing the evaluation and development of talented individuals, and ending with the maintenance of these talents in the organization.

The main objective of this contribution is to identify factors that influence the management of talent in enterprises. This research is specific because no research is focused on such important factors of development in the area of talent management in companies operating in Slovakia. Main added value is concentrated on identification of strengths and weaknesses of talent management process in companies.

## **Literature review**

Paper is focused on talented persons who can bring added value. Therefore, we use the word talent for key persons with above normal skills in any area (Silzer and Dower, 2010). Talent management as a key process is defined as a systematic and dynamic process of talent identification, development and retention (Egerová et al. 2015). Raising awareness of talent management and the need for talent in businesses is linked to a number of changes that have taken place in the field of human resources. Tansley (2011). Talent management must first be the philosophy of the top management of the company, otherwise it has no chance of success. The implementation of talent management results from the dynamic development of all business parameters, thus also changing the view of human resources, which has become a strategic issue that helps businesses create a competitive advantage.

Talent management appears to be a critical element that enables organizations to achieve a competitive advantage (Holbeche, 2009). At present, talented people present a competitive advantage, and therefore businesses need such people who can make huge changes. These people are scarce and maintaining them is much more challenging than in the past because they demand ever greater appreciation. They are mobile and have no problem finding and finding an application with better conditions (Bersin, 2013). Craig (2016) consider the greatest contribution of talent management to acquiring a key differentiator that will help distinguish the business from the competition in the current knowledge-based economy. Bethke-Langenegger, Mahler and Staffelbach (2011) showed in their study that companies focusing on the talent management has a statistically significant positive impact on

human resources in the company. People are well motivated, more satisfied with job, and trust in leaders. Talents can improve systematic recruiting system and increase employer branding as well (Froese, 2020). Nevertheless, HRM brings with it various smacks. The main problems related with talent management system are linked to inefficient career planning, promotion and motivation of talented employees (Daciulyte and Stankevich, 2015).

## Methodology

The research was carried out on a sample of 381 companies carrying out their business activities in Slovakia. The research sample was randomly determined. A questionnaire was used to obtain the data. The introductory part of the questionnaire consisted of classification items, where respondents reported the size of the enterprise, ownership, participation of foreign capital, economic results of the enterprise and the existence of a human resources unit. The main part consisted of 41 items (table 1), which were divided into five phases of talent management – strategic concept of human resources with regard to talent management, identification and acquisition of talent, talent assessment, talent development and talent retention. The individual items of the questionnaire were created as notification sentences in which individual respondents expressed the degree of consent. To do this, Likert scale of 1-5 was designed, where a value of 5 expressed absolute consent, a value of 3 neutral attitude and a value of 1 absolute disapproval. In order to identify statistically significant differences in respondents' responses in individual items according to sorting criteria (size of enterprise, ownership, participation of foreign capital, economic performance of the enterprise, existence of a human resources unit) parametric testing was also performed by the Kruskal-Wallis test and the Mann-Whitney test, respectively. All statistical tests were carried out at an  $\alpha=0.05$  significance level, through the SPSS statistical programme.

**Table 1. Items in the questionnaire**

<b>Strategy</b>
Talent management is essential (I1).
Talent management is an important part of our company's mission (I2).
Top management worked out a joint attitude towards talent management (I3).
We have a clearly defined human resources management strategy (I4).
We have a clearly defined talent management strategy (I5).
Talent management strategy is connected with strategic goals of our organization (I6).
We are currently modifying the list of key talents indispensable in our company (I7).
We search for talent in every single person that has just been employed (I8).
Formulated talent management strategy is not difficult to realize in our company (I9).
<b>Identification</b>
All positions in our company have been divided into key and peripheral positions (I10).
Our workers' competences are adapted to their position requirements (I11).
We are currently identifying talents among all the workers employed in our company (I12).
We are currently identifying positions we need to recruit candidates for from the external environment (I13).
We apply a plan of attracting talents from the external environment (I14).
Our recruitment system makes it possible to acquire people of the highest development potential (I15).
We know quite a lot about talents our employees have (I16).
Talented people are willing to get employed by our company (I17).
We know what talents we are going to need in the future (I18).

We know how many talented people we are going to need in the future (I19). We perform some special activities designed to attract talents (I20).
<b>Assessment</b>
We systematically assess our workers' performance (I21). We promote our workers on the basis of objective criteria (I22). We draw conclusions from the workers' performance assessment (I23). Talent management is linked to the workers' reward system (I24). Talented people's assessment is performed on the basis of specially designed criteria (I25). The results of workers' performance assessment are used to formulate talent development plan (I26). We have clearly defined criteria of workers' performance assessment (I27).
<b>Development</b>
We use a wide range of forms and methods of our workers' competences development (I28). In the recruitment process we take into consideration some above-average competences of potentials (I29). We have well-formulated career paths of talented workers (I30). We develop talents thanks to the plans we implemented (I31). In most cases the positions where our employees work make it possible to develop their talents (I32). We have enough time to develop our workers' talents (I33). We do have sufficient financial resources to support talent development (I34).
<b>Retention</b>
We successfully retain talented people (I35). Talented people have financial requirements that we can meet (I36). We have a clear system of motivating workers (I37). We encounter problems as far as the communication with talented people is concerned (I38). We manage to retain talented workers by supporting them in their self-improvement process (I39). Talented people leave our company in search for new challenges (I40). We support talented people in a special way (I41).

Source: own results

## Results and discussion

The aim of the research was to uncover factors that influence the management of talent in enterprises and identify the strengths and weaknesses of talent management in companies operating in Slovakia. Research carried out on a sample of companies operating in Slovakia showed a number of differences in talent management between companies in terms of several criteria. The first factor examined was the size of the companies. This factor identified 17 statistically significant differences between SMEs and large enterprises. The items in which differences in the notion of talent management have been recorded are shown in Table 2.

**Table 2. Statistically significant differences according to size of the company**

SIZE	I4	I5	I7	I13	I14	I18	I19	I20	I21
<b>Chi-Square</b>	26.923	16.568	11.063	9.584	11.748	8.079	7.676	12.431	24.921
<b>p value</b>	0.000	0.000	0.004	0.008	0.003	0.018	0.022	0.002	0.000
	I25	I26	I27	I28	I29	I31	I34	I40	
<b>Chi-Square</b>	7.367	7.988	8.391	18.729	11.432	11.105	7.396	7.967	
<b>p value</b>	0.025	0.018	0.015	0.000	0.003	0.004	0.025	0.019	

Source: own results

The second factor examined is the ownership of the business. In terms of this criterion, we found 13 statistically significant differences between private and state-owned enterprises. The identified differences are given in Table 3.

**Table 3. Statistically significant differences according to ownership of the company**

OWNERSHIP	I10	I16	I17	I21	I25	I26	I29
Mann-Whitney U	4431.50	3898.50	3618.00	4363.00	3696.00	3922.00	3735.00
p value	0.043	0.015	0.003	0.025	0.034	0.009	0.010
	I35	I37	I38	I39	I40	I41	
Mann-Whitney U	3831.00	4225.00	3918.00	3694.50	3866.50	3558.00	
p value	0.014	0.042	0.030	0.012	0.011	0.022	

Source: own results

Another factor examined was the representation of foreign capital in the company. According to this criterion, 26 statistically significant differences were identified between enterprises with purely Slovak capital and enterprises where foreign capital is represented. The identified differences are given in Table 4.

**Table 4. Statistically significant differences according to capital allocated in the company**

CAPITAL	I3	I4	I5	I6	I7	I10	I13	I14	I15
Mann-Whitney U	13063.0	11284.0	11280.0	11713.5	11080.5	14682.5	13688.5	11581.0	14400.0
p value	0.014	0.000	0.000	0.000	0.000	0.040	0.044	0.001	0.036
	I17	I19	I20	I21	I22	I24	I25	I26	I27
Mann-Whitney U	13712.5	12656.5	10631.5	12366.5	14228.0	12233.0	11798.5	12454.0	12400.0
p value	0.009	0.012	0.000	0.000	0.047	0.001	0.002	0.000	0.001
	I28	I30	I31	I33	I34	I37	I39	I41	
Mann-Whitney U	10395.0	11287.5	11209.5	13100.0	13092.5	13990.0	13356.5	11832.0	
p value	0.000	0.000	0.000	0.007	0.007	0.017	0.032	0.005	

Source: own results

Next factor, which was the economic situation of the company, recorded 24 statistically significant differences in respondents' responses. The identified differences are given in Table 5.

**Table 5. Statistically significant differences according to economic situation of the company**

ECON.SIT.	I1	I2	I3	I4	I5	I6	I8	I9
Chi-Square	18.162	13.955	24.477	14.479	13.326	11.944	10.234	6.144
p value	0.000	0.001	0.000	0.001	0.001	0.003	0.006	0.046
	I15	I16	I17	I21	I22	I24	I26	I28
Chi-Square	13.714	10.496	11.582	8.351	9.492	14.041	19.055	18.407
p value	0.001	0.005	0.003	0.015	0.009	0.001	0.000	0.000
	I30	I31	I33	I34	I35	I36	I37	I39
Chi-Square	15.230	14.279	15.606	32.605	24.636	24.629	7.964	23.221
p value	0.000	0.001	0.000	0.000	0.000	0.000	0.019	0.000

Source: own results

The last factor examined was the existence of a human resources department. Within this factor, 25 statistically significant differences in responses were identified between companies which have an HR department and companies which do not have such separation. The identified differences are given in Table 6.

**Table 6. Statistically significant differences according to existence of HR department in the company**

HR DEPT.	I3	I4	I5	I6	I7	I10	I11
Mann-Whitney U	11987.0	9724.0	11750.0	12611.5	10763.5	13012.0	13728.0
p value	0.001	0.000	0.000	0.002	0.000	0.002	0.009
	I12	I13	I14	I15	I18	I19	I20
Mann-Whitney U	11294.5	12186.0	10455.5	12292.5	11949.0	11187.5	10499.0
p value	0.000	.001	0.000	0.000	0.000	0.000	0.000
	I21	I22	I24	I25	I26	I27	I28
Mann-Whitney U	11572.5	13129.0	12233.0	11058.5	11827.0	11639.5	9253.5
p value	0.000	0.009	0.003	0.000	0.000	0.000	00.000
	I30	I31	I40	I41			
Mann-Whitney U	10543.5	10798.0	13072.0	12007.5			

p value	0.000	0.000	0.028	0.022
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Source: own results

As should be seen, the most important factor influencing talent management are the economic results of the company. These affect every single part of the talent management process. Most strikingly, the first, which is aimed at linking the human resources strategy to the company's strategy. Businesses with improved economic results show a greater focus on human resources as a strategic element of the company's growth. At the same time, they are able to invest more money in the development of talented individuals, as undertakings with impaired economic results, which documents a number of differences in the talent development phase compared to other enterprises.

The second most important factor influencing the talent management process is the existence of a human resources unit in the organizational structure. This plays an important role, in particular, in identification, talent acquisition and evaluation. As can be seen from the table, it is at these stages that the most differences can be seen compared to businesses, which do not have such organisational units. The HR department carries out many activities, to gain talent, identify them while drawing up the basis for talent assessment, for which undertakings without such a unit do not have sufficient human capacities, to develop an appropriate evaluation system. Foreign capital and the size of the business are also factors, that affect the process of talent management at all its stages. Ownership of the business appears to be the least influential factor. No differences between SOEs and private enterprises were identified at the strategy and identification phases. However, this factor has been shown significantly at the stage of retaining talent. At this stage, only seven items showed a difference, from which it can be judged, that private enterprises are significantly more successful, than state.

## Conclusion

Talented individuals can greatly help to improve zero waste management. The aim of the research was to identify strengths and weaknesses in the process of talent management in companies in Slovakia. The results show, that it is best for businesses to do so, in particular in terms of the strategic concept of human resources and the identification of talent, on the contrary, they are worse off in terms of the next stages of talent management than evaluation, development and retention of talent. It is here that we can see opportunities to further improve the talent management in these companies. It is improvements in weaknesses that could lead to an overall improvement in talent management in these enterprises.

The most serious strengths in the talent management process can be considered:

- talent management is seen strategically as very important,
- talent management is an important part of the business mission,
- is a defined human resources management strategy,
- jobs are divided into key and other,

- the job competences of employees are adapted to their job position,
- staff performance is systematically assessed and evaluations draw conclusions suitable for planning talent development,
- the staff reward system is based on objective criteria,
- the selection process takes into account their above-average skills,
- communication with talented individuals is at a high level.

On the contrary, weaknesses are in particular the following:

- the talent management strategy is considered difficult to implement in enterprises,
- businesses do not carry out special activities aimed at attracting talent,
- the career development planning system is not well redesigned,
- predetermined plans are not used to develop talents,
- there is not enough financial resources in enterprises to develop talent,
- fails to meet the financial requirements of talented employees,
- specific procedures are not used to retain talent and therefore, due to the existence of other challenges.

HR management focusing on talents is on higher level in large companies what was confirmed by other authors in previous research (Boštjančič and Slana, 2018; Valverde, et al. 2013). They summarized that talent management in SME is more unplanned, unsystematic, and intuitive, compared to large companies. What is very interesting result from our results, retention is more successful in small companies because we did not find similar results in the previous literature. Other factors such as an ownership, foreign capital, and economic situation are in line with the results of previous studies (Valverde, 2013; Krishnan and Scullion, 2017; Ready et al., 2010). In these cases, private companies, companies with foreign capital, and companies with better economic performance has higher level of talent management integrated into managerial system. We added existence of HR department as another factor influencing in our research what can be understand as novelty into this kind of research because companies with HR department has specialists who can carry out on activities connected with talent management and therefore it is on higher level compared to companies where HR department is not implemented.

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# CORPORATE APPLICATION OF SOCIAL MEDIA IN THE LIFE OF SMALL AND MEDIUM-SIZED ENTERPRISES

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## Abstract:

**Purpose:** The field of research of corporate social media is in many respects related to the topic of zero waste management and the circular economy, as by applying it a company can make a great contribution to environmental protection. The aim of our study is to examine the importance that small and medium-sized enterprises operating in two regions of Slovakia attach to corporate social media.

**Design/methodology/approach:** In the course of our research, we conducted a quantitative questionnaire survey in the examined SME sector. A research question was formulated on the topic: which is as follows: What importance do the leaders of small and medium-sized enterprises attach to social media in the life of their business?

**Findings:** The results of our study were evaluated based on responses from 359 companies. The results suggest that although there are more small and medium-sized enterprises present on social media than not, they do not make the most of opportunities inherent in social media.

**Research limitations:** One of the main limitations of the study was the ongoing health crisis situation, due to which there was an inadequate willingness to complete the questionnaire sent out.

**Practical implications:** The results explain the question of SME sector leaders as to whether it is still worthwhile to invest time and energy nowadays in the active presence of their business in social media.

**Social implications:** With the help of our research, the reader can get a comprehensive picture of exactly what small and medium-sized enterprises use social media and how they are able to influence their own target audience.

**Key words:** corporate communication, corporate social media, marketing strategy, Slovakia, SME sector

## Introduction

Social media, as a concept, includes computer-aided devices that allow for the rapid exchange of information over virtual networks. (Balan, Rege 2017, p. 43)

It is a well-known fact that the internet and social media have an extremely large impact on the operation and success of a business. The main reason for this is that online communication provides an opportunity to replace physical proximity with virtual interaction. Social media itself refers to content that is spread through social interactions. These types of media offer a means to build relationships between consumers and businesses. This is why social media needs to prove to be an important tool for any business, as it allows organizations to communicate, listen and learn with their customers in ways they have not previously had the opportunity to do. (Jones, Borgman, Ulusoy 2015, p. 611)

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Millions of users use social media platforms every day, which are now the primary means of communication for all age groups. (Balan, Rege 2017, p. 43)

Social media has revolutionized business by offering an optional marketing platform that has gradually grown into a growing strategy. Globalization has made it necessary for every business to reach its consumers through a network that brings people closer to organizations and makes it easier for them to shop. (Basri, Siam 2017, p. 241)

Nowadays, with the increasing use of social media, businesses have made it easier to reach potential consumers, enabling customers and stakeholders to connect virtually, engage, and feel that their opinions matter. (Webb, Roberts 2016, p. 66)

Social media has now become a topic in the lives of businesses that they cannot avoid. The primary goal of our study was to examine the role of social media in the life of small and medium-sized enterprises in the Nitra and Trnava regions. In the course of the research, three hypotheses were formulated. Our results provide a comprehensive picture of whether there is a correlation between time spent on social media and marketing costs associated with online presence, company size, and monitoring and integrating target audience feedback, and the nature of businesses' activity and presence on social media.

### **Literature review / Research Background**

Over the past two decades, innovation activities in the online world have played and continue to play an important role in business, as Web 2.0 applications provide an opportunity to use social media to transfer Internet capabilities to a social environment where individuals can interact online way. (Tajvidi, Karami 2021, p. 1)

The term social media includes web-based platforms that offer users the opportunity to interact, that is, unlike traditional media, they offer the opportunity for social dialogue. Social media is a tool that allows users to place and perceive different types of information and can also be used as a marketing tool that requires constant updating, i.e. a tool that is key to achieving business goals. (Grizane, Jurgelane 2017, p. 192)

Social media is present in many forms in people's lives, which includes, but is not limited to, social networks, blogs, microblogs, forums, social games, business networks, photo sharing websites, and chat applications. (Constantinescu et al., 2019, p. 2)

Social media is the most effective tool for marketing. The importance of social presence is constantly growing as it is an extremely popular and accepted online space in people's lives. Its indispensability is manifested primarily in its ability to influence billions of people around the world, which has resulted in changes in the procedures and techniques required to perform operations in the professional world. Today, being online is a must for any business, as the world has changed and communication has become one of the key keys to success. Businesses need to understand and embrace this change, because by doing and adapting to it, they are creating a number of benefits and opportunities that are a condition for future growth and development. In terms of obtaining information, people most often use social

media. For this reason, a presence on social media is essential for business growth and development. (Li 2021, p. 961)

The corporate application of social media is changing organizational communication and public relations. The reason for this is that the online space allows for open communication, which on the one hand contributes to the understanding of consumer needs on the one hand and motivates them to respond effectively to these needs on the other hand. (Tajudeen, Jaafar, Ainin 2018, p. 308)

Social media allows marketers to influence consumers' purchasing decisions by promoting branded content. This is significant because promoting a brand has a big impact on sales, brand awareness, brand loyalty, and social media ROI. (Swani et al. 2017, p. 77)

It is important to mention two other extremely important benefits of using social media in companies. The first is cost reduction by decreasing staff time, and the second is Increase of probability of revenue creation. The second benefit mentioned is the sharing of information and skills, the use of customer wisdom, the ability to help, and the involvement of consumers. (Sajid 2016, p. 3)

Social media offers many benefits and opportunities for businesses. The first factor worth mentioning is learning, as organizations have the opportunity to observe what their consumers are doing, what is happening in their lives, and from this they can adapt to their consumer needs and develop their marketing strategies as quickly as possible. The second factor is targeted marketing. With the help of social media, companies are able to launch targeted marketing campaigns that will result in an increase in the number of target audiences, the basic condition of which is to increase the visibility of the business, in which social media also helps. In addition, being online is much more cost effective than traditional marketing tools. However, one of the biggest benefits of online platforms is the fast, honest, and detailed feedback you receive from consumers, which allows you to respond extremely quickly to changing needs, which can give your company a competitive edge over the competition. Responding appropriately and quickly to consumer feedback can also lead to a deeper commitment and a solid consumer base is a key factor in today's unpredictable world. In terms of corporate image, social media can contribute to increasing the credibility and reputation of organizations. The next notable benefit is tracking. Online platforms allow businesses to monitor the competitive position of competing companies and access and provide vital market information and statistics. It can also be said that social media accelerates innovation as well as the development of new products, as it can facilitate knowledge transfer, which contributes to the acceleration of innovation and the development of new products, and facilitates recruitment and recruitment. It was mentioned earlier, but it is important to mention again that social media improves communication between businesses and consumers. The last notable benefit is building consumer confidence and loyalty. (Radhakrishnan, Ugalde 2019, p. 6)

Overall, information obtained through social media is a key source of both customer analysis and market research, as well as the mass acquisition of new ideas. (Li, Larimo, Leonidou 2020, p. 53)

## Methodology

Our study began in February 2021 in the form of a quantitative questionnaire survey due to the ongoing health crisis. Our study sample includes 359 companies from the Nitra and Trnava regions. Our questionnaire was prepared using Google form creation software and examined the role of social media in the SME sector with a total of 27 questions. The filling was done anonymously. In addition to demographic data, our questionnaire included questions related to presence on social media, questions about tracking and using feedback, questions about future plans, and questions about the success of traditional marketing tools.

In our research, we formulated three hypotheses, which are as follows:

1. There is a significant relationship between the time spent on social media and the marketing costs associated with social media presence.
2. The size of the company and the observation of the feedback of the target audience and their integration into the company's activities are significantly related to each other.
3. There is a significant relationship between the nature of the companies' activities and the change caused by their presence in social media.

SPSS program descriptive statistical analysis was used to examine the relationships, within which a Chi-square test was performed. A significance level of 5% was determined during the evaluation.

## Results

In our research, we examined a total of 359 small and medium-sized enterprises in terms of the corporate application of social media. Based on the sample, it can be said that the companies surveyed are 66.3% micro, 26.2% small and 7.5% medium-sized and most have more than 10 years of experience in business presence. In the second part of the questionnaire, we asked companies about their presence on social media. The results showed that although 67.4% of the surveyed SME sector is present on social media, we were surprised to find that 32.6% of them are not present in the online space. Undoubtedly, businesses that are present on online platforms prefer Facebook almost 100%, followed by Instagram, which is becoming increasingly popular these days. In our next question, we were wondering exactly what businesses use social media for. 75.6% of the respondents use the opportunities provided by online space in terms of providing information. They also consider it important to build brand awareness as well as expand the number of target audiences. To the question of whether the company employs a separate person (s) / outsourced company who deals with social media presence. Most (74%) answered in the negative. We were also curious about how important it is in the lives of businesses to be present on social media. Respondents had the opportunity to answer the question on a 5-point Likert scale. Most responses chose option three, suggesting that social media presence is neutral for most businesses, however, there were far

more responses to options 4 and 5 than to options 1 and 2. that is, although neutral for most companies, presence is more important than not being present. The results also show that it is important for organizations to be online, primarily to reach new consumers, but also to provide information and awareness. As mentioned earlier, we formulated three hypotheses on the topic during the analysis. For the first hypothesis, we hypothesized a relationship between time spent on social media and marketing costs associated with social media. In the Chi-square test, we obtained 0.012, i.e., we rejected the null hypothesis, which assumes that there is no relationship between the variables, and accepted the alternative hypothesis, i.e., our assumption was confirmed. For the second hypothesis, we wondered whether there was a relationship between the size of the firm and the observation of feedback from the target audience and integration into firm activities. In this case, we obtained 0.002, ie our assumption was confirmed in this case as well, because the two variables are significantly related to each other. In the last hypothesis, we hypothesized that there is a significant correlation between the nature of firms 'activities and the direction of change caused by their presence on social media. The following result was obtained:  $P = 0.615$ . The result shows that in this case the null hypothesis is acceptable because the result obtained is greater than the specified 5% significance level, i.e. there is no relationship between the two variables. In the remainder of our questionnaire, we also placed great emphasis on whether the companies surveyed monitor the presence of competitors on social media. As a result, we found that most (41.8%) did not monitor competition at all, but firms that did, however, were surprised to find that the largest percentage (47.9%) did not use critical remarks made against competitors. We were also curious about what percentage of their marketing activities are spent on online presence. 70% of the SME sector surveyed are willing to invest only 0- 25% in this activity.

## Discussion

In the theoretical part of our study, the role and most significant benefits of the use of social media in companies are presented. In their 2015 study, Jones, Borgman, Ulusoy explained that social media should prove to be an important tool for any business. In our research, we found that for the entrepreneurs surveyed, in addition to the fact that most people consider online space to be moderately important, there are far more people who consider it more important than those who do not. It has been mentioned earlier that learning can be one of the benefits of social media, but our research found that a large percentage of the SME sector surveyed do not use critical remarks about competitors as well as feedback from the target audience. Tracking can also be defined as a key benefit, but our results show that a huge number of businesses today do not place much emphasis on taking advantage of the online space, although, as mentioned in the theoretical review, businesses can access vital market information and statistics. In today's knowledge-based society, where speed of information and adaptation is the basis of competitive advantage, businesses need to take advantage of the opportunities offered by social media. In addition to the benefits mentioned earlier, it is important to mention that social media is also an

important area of research for the environment, zero waste management and the circular economy. From a corporate point of view, great emphasis must be placed on this topic, as by applying it, companies can take advantage of the possibility of launching marketing campaigns that take place exclusively in the online space, with which they make a great contribution to environmental protection. It is also important to emphasize that this type of corporate activity reaches consumers much faster and can be modified much more easily and quickly in the event of obsolescence, without significantly polluting the environment. Overall, therefore, by having an online presence on social media, an organization can make a significant contribution to protecting the environment, as all activities take place online, so this area of research will be an important part of the future to invest.

## **Conclusion**

In our study, we found that more than 30% of the small and medium-sized enterprises in Slovakia surveyed are not present at all on social media. In our view, the primary reason for this is that they are afraid of change, insecure about the online world, but it is important to mention that in today's world, only a business that can adapt and manage uncertainty can be successful. Social media has become an integral part of society, businesses cannot avoid it if they want to remain present in the market necessary to adapt to their target audience. Surprisingly, we found that 41.8% of the companies surveyed do not pay any attention to the presence of competitors in social media. In this regard, it is surprising that businesses need to seize every opportunity to learn, for which social media offers an extremely cost-effective solution. It is important to keep in mind that you can learn a lot not only from failures, but also from successes. Furthermore, it can be said that nearly 50% of the companies surveyed do not use the feedback received from the target audience. The basis of successful operation and competitive advantage today is the appropriate background formed by the consumer base and the rapid adaptation to consumer needs. Without feedback, a business is unable to track the extremely rapid change in consumer demand. This suggests that a huge number of businesses are still unaware of the many benefits of social media that they could apply. In the case of a change since its presence on social media, it can be said that there was only a very little more response to the positive response option than no change. This is positive, as only 0.8% of businesses feel that social media has made a negative difference in their lives. Businesses that feel that there has been no change in their lives are unlikely to take advantage of all the opportunities offered by online space, which is the reason why almost 60% of the SME sector surveyed does not want to expand their presence on social media in the future.

Based on our results, it can be said that social media marketing costs are related to the extent to which the company monitors and uses the feedback from the target audience, however, the nature of the organizations' activities are not related to how the appearance on social media has brought about a change in the life of the company. In the future, our goal is to conduct an international comparative research, in which we examine small and medium-sized enterprises in Hungary and Slovakia

on corporate integration of social media, as well as to make suggestions and provide feedback to the SME sector on the appropriate use of online platforms.

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## GREEN CONTROLLING IN SMALL AND MEDIUM-SIZED AGRICULTURAL ENTERPRISES

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### Abstract

The art of controlling consists in predicting changes within the company, evaluating the identified changes and then proposing appropriate processes and approaches. One of the changes to which controlling must respond is the constantly increasing importance of environmental aspects at the company level, which is becoming a cross-sectional element of every functional area of the company. In recent years, the term "green controlling" has become increasingly common. It can be defined as a management supporting function that leads to that planning, management and control in the company include the so-called "Green content". The research study is focused on the evaluation of the approach of small and medium-sized agricultural enterprises in Slovakia to the ecological aspects of business, which is promoted by green controlling. In order to obtain objective information, an empirical research was realized - a questionnaire survey supplemented by interviews with representatives of selected agricultural entities. The results of the research study indicate that although the topic of environmental sustainability in business has become increasingly important in recent years, environmental aspects are not really integrated into corporate management. Many green controlling tools are unknown to representatives of selected companies. Farms prioritize achieving economic goals and environmental goals remain aside. The limiting factor of the research is the considerable ignorance of the agricultural holdings representatives about the ecological aspects entering into the management of the company, as well as their negative approach.

**Key words:** agricultural enterprises; green controlling; management; sustainability

### Introduction

Environmental protection and environmental sustainability are becoming cross-cutting elements of every functional area of business management. External stakeholders are increasing interest not only in financial information and information on economic performance, but also in information on the company's environmental focus. In this regard, controlling plays an important role in integrating sustainability components into corporate goals and corporate activities in management, planning and control. Controlling processes and tools should be extended to include ecological orientation.

Green controlling is a body that supports and raises awareness of company management and employees in environmental issues. It identifies ecological

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information requirements, collects them, selects relevant ones and analyzes these data. The collection of environmental information is essential for determining environmental performance and identifying opportunities and risks. Then it interprets this information to the company's management in the form of reports, which should include data processed into goals or key figures so that they can be integrated as target values into all information and decision-making processes of the company.

### **Literature review**

The issue of ecological sustainability has gained great importance in science and practice in recent years (Horváth 2018, p. 612; Isensee, Michel 2011, p. 436). Due to the growing reflection of stakeholders (e.g. investors, customers and non-governmental organizations) on sustainable business performance, the topic of sustainability has developed into a factor of strategic success in recent years (Michel, Isensee, Stehle 2014). In order to implement sustainable corporate governance, companies face the challenge of harmonizing economic, environmental and social goals (Isensee, Michel, 2011, p. 436). Environmental aspects can affect the economic success of companies. In most cases, however, environmental factors are not yet truly integrated into corporate governance. It is time to link environmental management and controlling more closely and to embed environmental factors in the planning and remuneration system (Günther, Günther, Endrikat, 2018, p. 34).

Controlling as a management service has to follow changes in management's activity and become proactive driver of innovation. Controllers and the management have a joint responsibility to reach the objectives because they help design management process. The importance of innovation for company's sustainability impacted also the practice of controlling. As a management service which provides transparent information for decision making process, controlling has to follow management's focus and activities (Vitezic, Vitezic, 2015, p. 176). Since human activities have transformed the biosphere, leading to global climate change, biodiversity loss and various types of pollution, 'green' or sustainability controlling has been developed to support management in the face of new challenges (Bedenik et al. 2019, p. 23). There is a variety of terms used to name "green controlling" such as environmental controlling, ecologically oriented controlling, ecological controlling, eco-controlling etc. The concept is widely spread and accepted in German-speaking countries, whereas the Anglo-American scholarly community conceptualizes "environmental management control systems" or "environmental management accounting" (Păunică, Mocanu 2017, p. 1137).

Green controlling has an active role that goes beyond aspects of economy and economic indicators, and is increasingly focused on sensitizing, consulting and motivating management and other decision makers by constantly reviewing the environmental consequences of individual activities and business decisions. This

also means the expansion of controller tasks in the direction of green goals and information (Bedenik et al. 2019, p. 23). The objective of sustainability controlling is the comprehensive support of sustainability management, namely formulating and implementing a corporate policy that comprehensively covers all three dimensions of sustainability – people, planet, and profit (Păunică, Mocanu 2017, p. 1137). The managers of an economic entity may use the data regarding the physical consumption and the costs displayed by environmental management accounting in order to adopt decisions having impact both upon the financial performance of the economic entity and upon the environment (Vasile, Man 2012, p. 570). A considerable barrier to the use of sustainable management are also high costs of implementation of pro-ecological and pro-social solutions in enterprises (Pabian, Pabian 2014, p. 105).

Among the intensively discussed issues is whether it is financially advantageous to focus on environmental and social performance. Supporters argue for access to better resources, more efficient resource management, additional business opportunities and cost savings through more efficient use of resources. Critics, on the other hand, point to the additional costs of sustainability management (Greiling, Ther 2010, p. 39). Changes in interests outside the company and within the company mean that the ecological design of the company's activities is no longer perceived only as a cost factor but is also used as a means to improve the company's image. It recognizes the awareness that adequate consideration of environmental goals is a basic prerequisite for the long-term success of society in addition to the economic and social dimension of sustainability (Horváth, Isensee, Michel 2012, p. 50).

## **Methodology**

The outputs presented in this article are the result of a pilot survey of an extensive research study. The aim of this paper is to evaluate the approach of small and medium-sized agricultural enterprises to the implementation of environmental aspects in management of the enterprise, which promotes green controlling. In order to obtain objective information, an empirical research was carried out - a questionnaire survey supplemented by interviews with representatives of selected agricultural entities. The basis for creating a questionnaire, the results of which formed the basis of empirical research, was the collection of theoretical knowledge in the field of green controlling. We focused on foreign studies and scientific publications dealing with similar issues.

The subject of the investigation was small and medium-sized agricultural holdings. Small and medium-sized enterprises in Slovakia make up a decisive share of the total number of business entities and are one of the basic preconditions for the healthy economic development of the country. This statement is also confirmed by studies (Pletnev, Barkhatov 2016, p. 185; Yoshino, Taghizadech-Hesary 2019, p. 342; Stanciu 2014, p. 255; Mura, Buleca 2014, p. 905; Dobrovič 2015, p. 594). The

primary technique of data collection was a questionnaire, which was created and distributed to farms using an internet application at the beginning of the year 2021. The return rate of the questionnaires was at the level of 27%, i.e. 67 completed questionnaire forms. Corporate managers (managers, directors, heads of economic departments, controllers, accountants) were asked to fill in the questionnaire.

The introductory part of the questionnaire contained the so-called classification questions that approached the structure of the research sample in terms of number of employees, legal form of business, length of market presence and foreign capital participation. The main part of the questionnaire consisted of questions aimed at obtaining information on the approach of agricultural enterprises to the implementation of environmental aspects in business management. Common mathematical methods supplemented by descriptive statistics and graphical representations were used to evaluate the questionnaire. The statistical method - Chi-square test was also used, which is aimed at determining the dependence between the studied phenomena. In order to clarify and supplement the information obtained through the questionnaire, we also used the method of interview. We tried to obtain reliable information directly from the source. Business managers from three farms answered the questions we tried to better understand the answers of the respondents in the questionnaire. To the questions we tried to better understand the answers of the respondents in the questionnaire, business managers from three farms answered.

**Table 1 Structure of the researched enterprises**

<i>Classification criteria</i>	<i>Enterprise category</i>	<i>Total</i>	<i>Relative</i>
Legal form of business	Collective	23	34%
	Limited liability company	44	66%
Size of business	Small business	31	46%
	Medium-sized business	36	54%
Length of market presence	Less than 5 years	5	7%
	More than 5 years	27	40%
	More than 15 years	35	52%
Foreign capital	with foreign capital	16	24%
	without foreign capital	51	76%

Source: our processing

## Results and discussion

Through a questionnaire survey supplemented by interviews with selected agricultural entities, we found out what is the approach of small and medium-sized agricultural enterprises to issues of sustainability in management and also whether agricultural enterprises apply some elements of ecological controlling.

### Perception of green controlling by small and medium-sized agricultural enterprises

Based on the questionnaire structure with the initial questions we tried to find out whether management of agricultural enterprises understands what the term green controlling includes.

We wanted to find out if they knew the concept of green controlling. From a research sample of 67 entities, 41 entities answered this question.

Most of the respondents who answered this question expressed a clear opinion that green controlling means management that supports ecological elements in business. Some respondents answered in more detail that this is planning and control, aimed at minimizing negative impacts on the environment.

Among all respondents, there was also found some which have expressed their disagreement to the green controlling. Based on their answer we could state, that they named it only as a modern expression that hardly anyone understands and in which there is nothing substantial.

We expanded the research of this area by another question and we surveyed the respondents about their opinion on what the green controlling content includes, respectively which activities or processes. Based on the study of professional literature, we formulated six partial activities, which are the subject of green controlling

Respondents were asked to rate the importance of performing these activities on a scale of zero to five. Respondents gave the highest weight to the activity, which is focused on providing key data for planning, control and management, whereby green controlling ensures transparency in environmental issues. For almost the same important green controlling activity respondents consider the monitoring of achievement of set environmental goals and compiling reports. The respondents gave the lowest weight to the activity aimed at adapting management processes in the company to green problems. This results from the nature of controlling itself, which is only an advisory body to management and does not have the power to act and make decisions.

**Table 2. Tasks of green controlling**

	Modus	Median	Average	Min	Max
Demonstrate and ensure the economic efficiency of the company's ecological orientation	3	3	3,66	3	5
Monitoring the achievement of set environmental goals	5	5	4,85	4	5

Promote transparency on green issues through key data for planning, control and management	5	5	4,93	4	5
Identifying key factors for achieving the so-called "green success"	4	4	3,66	3	5
Support for the implementation of "green aspects" in the company's strategy	4	4	4,24	3	5
Adapt management processes in the company to green problems	3	3	2,75	2	4

Source: own processing

In *table 3* are presented respondents' opinions on the activities for which the controller should be responsible. In general, the controller is responsible for providing information to the value chain. This definition is also confirmed by the answers of the respondents. According to them, in the performance of its function, the controller has the responsibility for providing information on green issues to the company's management. Bedenik (2015, p. 161) also confirm that sustainability reporting is a new controlling task. In addition, controller should actively advise stakeholders on controversial environmental issues and should raise the awareness of the company's management about promoting green aspects in business.

**Table 3. Responsibility of controllers**

	Modus	Median	Average	Min	Max
Continuously support the importance of linking the economic and environmental goals of the company	4	4	3,93	3	5
Raise awareness of green issues in society	4	4	4,46	4	5
Provide information on the so-called green problems for the company's management	4	4	4,72	4	5
Actively advise the company's stakeholders (company management) on environmental issues	5	5	4,81	4	5
Give impulses and coordinate the implementation of "green goals" into company processes	3	3	3,16	3	4

Source: own processing

### Application of ecological aspects in management

Other questions were aimed at finding out how companies solve specific approach to green issues. Therefore, in the next question, we found out whether the surveyed companies take into account environmental aspects in management. Of the 67 agricultural holdings, 40 companies answered positively. In the remaining 27 companies, environmental targets are not defined at all. From interviews with selected business entities, we found that many companies implement environmental measures only if they have an economic benefit, e.g. elevating the image of society Rajnoha et al. (2019, p. 61) confirm that nowadays, customers are increasingly looking at sustainability aspects, and this situation to become even more intense in the future.

In order to determine the dependence, we performed a Chi-square test in which we examined whether the size of the company, the legal form, the length of operation in the market and foreign capital participation had an impact on the respondents' answers. From the analysis, we found that whether companies solve environmental management problems depends on the participation of foreign capital in the company, so we accept hypothesis H1.

**Table 4. Results of Chi-square test**

Chi-square test	
p value	0,030157

Source: own processing

Respondents who answered positive to the previous question were further asked in which processes they pay the most attention to environmental goals.

**Table 5. Processes that take into account environmental objectives**

	Modus	Median	Average	Min	Max
Strategic planning	4	4	4,09	3	5
Operational planning	3	3	2,91	2	5
Budgeting	2	2	1,55	0	2
Costing	2	2	1,66	0	2
Reporting	4	4	3,81	2	5
Risk management	3	3	2,76	1	3
Investing	4	4	3,78	3	4
Business consulting	3	3	2,67	1	4

Source: own processing

From the questionnaire answers, the respondents gave the highest weight to strategic planning, reporting and investment. On the contrary, they take the least into account environmental objectives when calculating costs.

**Table 6. Green controlling tools applied in agricultural enterprises**

	Modus	Median	Average	Min	Max
Life cycle assessments	0	0	0,48	0	1
Ecologically oriented portfolio analysis	2	2	2,03	1	4
Creating a budget for the environment	2	2	2,04	1	3
Cross-impact analysis	0	0	0,19	0	1
Environmental audit	4	4	3,36	1	5
Environmental costing	2	2	1,97	1	3
Material and energy balances	2	2	2,03	1	3
Value chain analysis focused on ecology	0	1	1,19	0	3
Ecologically oriented early warning systems	0	0	0,24	0	1

Source: own processing

Among the tools of green controlling, the most frequently applied in agricultural enterprises is environmental audit, creation of a budget for the environment and material and energy balances. The tools of green controlling are also highlighted by Rusko et al. (2014, p. 491), who confirm that environmental audit can reveal insufficient compliance with environmental duties imposed on companies within their individual operative units of production. From an interview with representatives of selected agricultural enterprises, we found out that many green controlling tools are unknown. On the other side, Marsina et al. (2019, p. 772) state that the pro-environmental behavior of companies can be influenced and that companies with limited resources should focus on organizational norms and standards and employee training and development to achieve the greatest positive effect on pro-environmental behavior.

## Conclusion

The results of the empirical research show that most agricultural enterprises do not have a deeper knowledge of the ecological direction and management of the enterprise and the importance of green controlling. As regards the implementation of its instruments, agricultural holdings are lagging behind. Environmental objectives in business are usually taken into account only if they have an economic benefit, such as increasing the company's image. Environmental aspects are most

often implemented in the field of strategic planning. The most applied green controlling tool is environmental audits. Many of the tools covered by green controlling are unknown on farms. Farms are resistant to any changes and are reluctant to change existing practices and methods. At the same time, farm managers think that the implementation of environmental controlling tools will be connected with high costs. This also follows from the fact that in general there are certain gaps in the understanding of the concept of controlling, so it would be appropriate to provide more extensive training and seminars on this issue. In practice, green controlling cannot be implemented overnight. The implementation of the corresponding green controlling tools consists in the identification of key problems of sustainable management and the systematic integration of environmental goals into the corporate strategy.

Promoting ecological aspects into entrepreneurship on agricultural holdings is a challenging process. Future research should focus on solving the problems of measuring and evaluating environmental aspects and integrating them into existing IT systems and business tools. The limiting factor of the research is the considerable ignorance of the agricultural holdings representatives about the ecological aspects entering into the management of the company, as well as their negative approach.

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# KNOWLEDGE ABOUT COVID-19 AS AN ELEMENT OF HEALTH PROFESSIONALS SATISFACTION MANAGEMENT

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**Abstract:** The experience in the fight against the COVID-19 pandemic shows the difficult and sometimes dramatic conditions of medical professionals' work. For most of them, constant exposure to a dangerous virus undoubtedly affects not only their sense of security, but also their satisfaction in terms of functioning in the workplace. In the era of universal and instant communication channels in the form of the Internet and various types of communicators, citizens received various, mostly contradictory and false information about the virus, the situation of the pandemic and the rules of safe functioning within it. It seems, however, that the group of medical professionals, by virtue of their education and occupations, was and is one of the best prepared groups of employees in terms of information. In addition to their knowledge of the virus itself, these employees also have the knowledge of where to find reliable information on the latest scientific reports on the disease. These circumstances undoubtedly shape job satisfaction.

**Purpose:** The purpose of this article is to present the views of medical professionals regarding their job satisfaction in relation to their access to knowledge and information about the COVID-19 pandemic and their functioning in the workplace.

**Design/methodology/approach:** The research was conducted in December 2020 on a representative sample of healthcare professionals with the aim to identify their opinions on functioning in the workplace during the COVID-19 pandemic. For the research purposes, the CATI technique was applied with a Likert scale-based questionnaire. The following tests were used for the purpose of data analysis in the STATISTICA program: the Kruskal-Wallis ANOVA on ranks test, the Mann-Whitney test and Pearson's chi-square test. The strength of correlations between the variables was evaluated by means of Spearman's rank correlation coefficient.

**Findings:** The statistical analysis shown the relationship between the employee access to knowledge and information variables and the job satisfaction variable. Spearman's rank order correlations for the satisfaction index, with  $p < .00100$  in relation to the assessment of how the employer copes with functioning under the COVID-19 pandemic conditions in terms of the flow of information necessary for proper functioning under pandemic conditions (0.4408) and in relation to the assessment of the work organisation in terms of accessibility to knowledge and information on the current situation (0.4344) confirm that better access to knowledge is a factor that increases job satisfaction among medical professionals.

**Key words:** knowledge and information, work satisfaction, healthcare professionals, COVID-19 pandemic

## Introduction

The situation that the world and Poland faced because of the outbreak of the COVID-19 pandemic revealed many weaknesses and problems in the functioning of public systems, economic units, societies and institutions. We are now witnessing a joint international effort to contain and eradicate the virus, the emergence of which has paralyzed the economies of countries but above all exposed all the weaknesses

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of health systems (Campbell et al, 2013, Rypicz et al, 2020). Medical professionals play a special role during the fight against the pandemic. In Poland, this group includes GUS (CSO- Central Statistical Office, 2018): physicians, dentists, pharmacists, nurses, midwives, physiotherapists, laboratory diagnosticians and paramedics. For years, staff shortages have been observed in Poland (but also in other European countries) resulting, among other things, from many years of negligence in shaping personnel policy in health care (Supreme Audit Office, 2016). The most important of these are: mismanagement of human resources, mismatch between the structure of employment and the profile and scope of services provided, lack of planning in the education system, and underfunding of the health care system (Domagała, 2013). Compared to the world and Europe, the situation of Polish medical personnel is extremely unfavourable. Poland has one of the lowest employment rates in different groups of medical professions in the European Union, unfavourable age structure of doctors and nurses, professional emigration and frequent protests and strikes of different groups of medical professions - resulting from low remuneration and excessive workload (European Union, 2012; Supreme Chamber of Nurses and Midwives, 2021). In such circumstances, Polish healthcare employees were faced with the problem of dealing with the results of the COVID- 19 pandemic. The work of medical professionals also varied at different stages of the pandemic. After a relatively mild wave of infections in spring 2020, a second autumn wave came, which put the Polish health care system on the edge of its operational capacity. The survey, the results of which form the basis of this study, was carried out just after the November peak of infections. Expecting that the results of the study would reveal some interesting patterns related to the functioning of medical professionals in their work environments during the crisis, the authors of the study defined the research problem as follows: How do medical professionals perceive their professional functioning under conditions of the COVID-19 pandemic in the areas of: job security; work organisation; employee relations; and job satisfaction and meaning. The timing of the survey provided an opportunity to explore the views of employees just after the difficult experience of the pandemic which is extremely beneficial in terms of exploring feelings of satisfaction.

The purpose of this article is to present the views of medical professionals regarding their sense of satisfaction in relation to access to knowledge and information about the COVID-19 pandemic and their functioning in the workplace.

### **Theoretical background to the issue**

Employee attitudes such as satisfaction, commitment, loyalty or responsibility are defined as the views, feelings and reactions in behaviour that a given person displays towards other people, objects or events (Biettel, 2002, p. 62). Robbins (2004, .p 50) defines attitudes as positive or negative evaluations of objects, people or events. Both of these definitions point to the subjectivity of the employee's feelings in the areas in question and the evaluative way in which he or she perceives the organisation as a whole, the phenomena and situations he or she encounters, and the people with whom he or she works.

Attitudes often overlap and influence each other. Knowledge of employee attitudes and research into them provides information not only on the attitudes themselves, but also on the range of factors that shape them. The importance of the aforementioned employee attitudes, including satisfaction, increases especially in relation to crisis, atypical situations (Stasiuk, 2012) such as functioning under conditions of the COVID-19 pandemic. In these situations, the employee is required not only to comply with generally defined standards of behaviour, but also to fully activate his/her own knowledge, skills and social competences to solve problems arising in the workplace. Identifying and building employee attitudes is also a very important part of human resource management.

Satisfaction is an individual reaction to working conditions - the more they are in line with the employee's expectations, the greater his or her satisfaction with work (The power of commitment ..., <http://barometrzaangazowania.com>). Caring for the work environment is therefore an expression of the subjective treatment of the employee (Robak, Słocińska, 2012). The adaptation of work and its environment to the employee has an economic dimension in terms of benefits gained or losses not incurred. This directly concerns, among other things, the costs of absenteeism, fluctuation, accidents at work, reduced productivity and quality of work, strikes, or mistakes committed in organisational management. This aspect has recently been particularly highlighted in relation to medical professionals. One group of factors that are related to working conditions are the so-called social working conditions (Robak 2012a; 2012b), i.e. interpersonal relations, relations with superiors (also taking the manner of exercising authority into account (Skolik, 2009, p.71), or communication processes such as sharing knowledge and information (Słocińska 2014, Albrychiewicz-Słocińska 2017). Shortcomings in this area may have a negative effect on the quality of life of the members of the organisation and become a source of stress (Pocztowski, 2007, p.377) and thus affect the sense of job satisfaction and employee commitment.

One of the factors that shape job satisfaction is the need to feel safe. Many authors emphasise that knowledge, skills and competences allow people to co-create not only their own safety, but also the safety of others (Le Morvan, 2016; Breu et al, 2004). By knowledge here we mean both declarative knowledge (I know that), procedural knowledge (I know how to behave) and contextual knowledge (situational applicability of the knowledge possessed giving the answer when? and why?) (Beccari and Heemann 2021; von Krogh et al, 2012; Nonaka, 2007; Botma 2020).

Since organisational systems are also intersubjective networks of meanings (Sułkowski 2016; Słocińska, 2012), the knowledge provided by organisations and distributed within them is provided with a specific context (Bleijenbergh, 2021; Słocińska, 2011) and thus affects the sense of security - it provides a sense of having control over the situation. Everyone, on the basis of the knowledge they have, learns and makes changes in their own knowledge and, consequently, not only in their own behaviour, but also in their attitudes and values (Słocińska, 2013).

With regard to the research findings presented in the study, it was assumed that the medical professional community is equipped with expert knowledge on the development of infectious diseases, the main routes of their spread and the daily safe

functioning at work. The subject of interest was rather knowledge and information about the pandemic, its scale, dynamics and the changes that are taking place in medical facilities as a result of top-down decisions related to the national pandemic strategy and the role of the employer in this process.

## Methodology

The research results presented in the paper are part of a nationwide quantitative survey of medical professionals carried out as part of the project "Survey of medical professionals' opinions on their functioning under conditions of the COVID-19 pandemic in the workplace" in December 2020, with the participation of the specialist external company DRB Polonia.

The following research assumptions were made in the area of analysing the impact of knowledge on job satisfaction:

- the COVID-19 pandemic situation has affected the sense of job satisfaction of all groups of medical professionals;
- medical professionals have better-than-average access to specialist knowledge concerning the SARS-cov-2 virus and the principles of safe functioning in the workplace during the pandemic.

In the framework of the conducted research the following problem was identified: How do the interviewed medical professionals assess the access to knowledge about COVID 19 and the rules of operation during the pandemic and how does it affect their job satisfaction, in the context of the operation of health care units in crisis resulting from the COVID-19 pandemic situation in Poland?

The study was carried out using quantitative research methods, using the CATI (Computer Assisted Telephone Interview) survey technique. The technique was selected due to the limitations of direct contact resulting from the COVID-19 epidemic in Poland at the time of the study. The research population was made up of medical professionals according to the GUS (Central Statistical Office) classification. The survey comprised a randomly selected representative sample of N=384 medical professionals, determined from the 2018 GUS report (population of medical professionals was: 400,986 individuals).

The research tool used was a standardised questionnaire consisting of closed questions and statements. A Likert scale (the so-called Likert scaling technique) was used for the responses. The research tool - the questionnaire has an authorial character and was formulated by the members of the research team - employees of the Department of Psychology, Sociology and Management Communication of the Faculty of Management, Częstochowa University of Technology.

The STATISTICA software was used in the process of compiling the research results. Non-parametric tests were used to assess the significance of differences in analysed variables: Mann-Whitney U test (UMW), Kruskal-Wallis ANOVA test (AKW). The Spearman's rank correlation coefficient was used to assess the strength of correlations occurring between variables.

In preparing the methodology of the research, due to the unprecedented nature of the phenomenon studied and the prevailing pandemic situation, and the lack of

literature studies in this area, no research hypotheses were adopted. Whereas, for the purpose of analysing the results of the study, a number of statistical hypotheses were defined regarding the presence of significant differences in the statements of the respondents due to their characteristics and due to the characteristics of the organisations employing them. It was assumed that  $H_0$  is a hypothesis that there are no differences due to the grouping variable, while  $H_1$  is an alternative hypothesis that there are such differences. The study presents only correlations verified by statistical tests allowing to conclude on the regularities occurring in the studied population.

## Results

In relation to the indicator defining the level of satisfaction with the job currently held by respondents, it was noted that only 3.9% of respondents strongly denied such feelings and 6.3% declared that they rather do not derive satisfaction from their job at the moment. However, the vast majority of respondents (69.3%) stressed that they did feel satisfaction with their work. 20.6% of respondents could not specify whether they felt satisfaction or not. Given the circumstances of the study and the research group, this result is somewhat surprising.

With regard to the evaluation of the level of satisfaction, the following statistically significant differences were observed in the statements of medical professionals due to: family situation, i.e. living with persons whose health the respondents were particularly concerned about (the results of the UMW test ( $p = 0.0262$ ), at the adopted level of significance ( $\alpha = 0.05$ ) indicate rejection of the verified null hypothesis of the existence of no differences) and the form of employment (AKW  $p = 0.0453$ ,  $\alpha = 0.05$ ). The analysis of the contingency tables and histograms revealed that those living with people whose health they were particularly concerned about indicated relatively lower levels of satisfaction than other employees. With regard to the forms of employment, on the other hand, those employed under an employment contract declare higher levels of satisfaction than those employed under an employment relationship, contract, contract of mandate or apprenticeship contract).

The study defined the following indicators on employees' access to knowledge and information:

- Whether the employer can cope with functioning under the COVID-19 pandemic conditions with regard to the flow of information necessary for proper functioning under pandemic conditions.
- How do you assess the organisation of work in terms of: accessibility to knowledge and information on the current situation (organisation of meetings, briefings, issuing of orders, etc.)?

In the group of questions related to access to knowledge and information, in the first question assessing the employer in terms of the flow of information necessary for the proper functioning of the workplace, as many as 70% of respondents considered that employers perform this task very well or well. Only 12% of respondents in this assessment gave negative or definitely negative opinions.

Employers' high ratings are reflected in the responses regarding the assessment of work organization in terms of access to information and knowledge through meetings or indirect communication (e-mails, orders, information brochures, etc.) - 67% of good or rather good ratings compared to 11% of negative ratings. With regard to involving employees in the process of creating procedures for conduct, the results were slightly worse, although the evaluations were mostly positive (59% of respondents). The number of those giving negative opinions was slightly higher, but remained at only 13%.

With regard to the overall assessment of the employer in terms of the flow of information necessary to function under pandemic conditions, only one statistically significant difference was observed in the statements of medical professionals employed in the so-called covid hospitals versus those employed in other hospital facilities (UMW  $p = 0.0173$ ,  $\alpha=0.05$ ). Employees of the latter rated their employers slightly worse in this respect.

The statistical analysis also attempted to determine the relationship between the employee access to knowledge and information variables and the job satisfaction variable using the Spearman's rank correlation coefficient. Spearman's rank order correlations for the satisfaction index, with  $p < .00100$  in relation to the assessment of how the employer copes with functioning under the COVID-19 pandemic conditions in terms of the flow of information necessary for proper functioning under pandemic conditions (0.4408) and in relation to the assessment of the work organisation in terms of accessibility to knowledge and information on the current situation (0.4344) confirm that better access to knowledge is a factor that increases job satisfaction among medical professionals.

## Discussion

When analysing the research findings, it should be noted that certain limitations have to be taken into account. The first limitation concerns the selection of the sample - although it is representative in terms of the structure of professions within the surveyed population, the survey itself has a questionnaire character and should be repeated in an in-depth and extended form (although it is not possible to repeat the circumstances surrounding the moment of the survey). The second is the fact that the research was carried out after the peak of the autumn infection wave, which was associated with reduced negative tension among respondents and consequently over-optimistic assessments of the issues under study. Another factor that may distort the respondents' statements is the hopeful expectation of a better tomorrow for the vaccination of medical personnel, which began less than a month after the peak of the second wave of infections.

Despite these limitations, the survey results presented here provide an insight into the problem under analysis and indicate a relatively high sense of job satisfaction among medical professionals. Interestingly, no significant differences were observed in the statements of respondents from the different professional groups comprising the population of medical professionals. This is important as some professions, e.g. pharmacists and diagnosticians, were less exposed to the virus than, for example,

doctors, nurses and paramedics. There are also no significant differences in the statements of respondents employed in public and non-public facilities. Although it is often claimed that in Poland, non-public health system facilities operate much more efficiently than public ones and cope better with staff management problems.

The results confirm that the relatively high satisfaction rates among medical professionals should be linked directly to access to medical expertise and authorities in the workplace.

## Conclusion

The research has led to two important conclusions. The first one is that medical professionals, the occupational group most exposed to infection and burdened with a physically and emotionally demanding job, declare a relatively high sense of job satisfaction, which, however, should be associated mainly with their expertise. The second conclusion is less clear, although a link was observed between access to knowledge about the pandemic and job satisfaction, there is no clear indication of how significant is the role played by the organisation in this process. Definitely this area of analysis should be made more specific and re-examined.

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# MANAGEMENT OF MEDICAL PERSONNEL IN THE SITUATION OF THE COVID-19 PANDEMIC AND THE SENSE OF THE MEANING OF WORK

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**Abstract:** The healthcare sector is an interesting research area for various fields of science, including organization and management. The outbreak of the COVID-19 pandemic caused additional issues and new challenges for organizations' managers. It is worth noting that when employees feel that what they are doing makes sense, their commitment to work clearly increases.

**Purpose:** The aim of this article is to present the healthcare personnel's opinions in terms of how COVID-19 pandemic affected the organization of their work and the sense of meaning of performing assigned duties.

**Design/methodology/approach:** In order to identify the opinion of healthcare personnel on functioning in the workplace during the COVID-19 pandemic, a study was conducted in December 2020 on a representative sample of employees of this organization. The CATI technique with a Likert scale-based questionnaire was used for the research. **Findings:** The research results show the relationship between the management of personnel in healthcare units in Poland and the sense of the meaning of their work during the COVID-19 pandemic.

**Research limitations:** The COVID-19 pandemic situation, affecting organizations and society, is unprecedented due to its increase, resources or solutions involved, and the lack of existing literature.

**Practical implications:** The presented research results highlighted not only the image of the work environment of Polish healthcare workers, but also show the way how it can be improved.

**Key words:** COVID-19 pandemic, management in healthcare units, the sense of the meaning of work

## Introduction

The health sector is a very important economic area in each country and thus an interesting research area for various fields of science, including management in particular. Unfortunately, Polish health care facilities are underfunded, often show a low level of efficiency in the management of their resources and inefficient organization of work, which leads to numerous problems in their management. The outbreak of the COVID-19 pandemic has caused additional difficulties and new challenges for managers of these organizations (see Iyengar et al. 2020, pp. 943-946; Restubog et al. 2020). The pandemic forced the introduction of extraordinary organizational arrangements and the involvement of a variety of resources, as well as the associated risks, made it necessary to support employees in maintaining a sense of security and sense of work. This theme is part of the broad problem of loss reduction, since the untapped potential of healthcare staff is a clear loss that can be analysed in organizational and social terms.

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The aim of this article is to present the views of medical staff on how the COVID-19 pandemic has affected their work organization and the sense of carrying out their duties. The presented results of the study not only present a picture of the working environment of Polish health professionals, but also indicate how the management of medical workers can be improved using the experience of the crisis caused by the pandemic.

## Research Background

The management process in organizations, regardless of their type, the industry in which they operate, whether they perform tasks and objectives, can be characterized by identifying four basic activities (functions): planning, organizing, conducting, and controlling. Management is a process undertaken by one or more people (managers) to coordinate the activities of others (employees) in such a way to achieve results that are not achievable for a person acting alone (Scully-Russ, Torracco 2019, pp. 66-93). Organizations use four types of resources in the management process: human, material, financial and information. And while all resources are essential to their operation, people are absolutely the most important resource. Human resources are all members of an organization, i.e., employees with their potential, knowledge, experience, skills, or talents. Today's managers can't only be administrators of the resources entrusted to them to achieve their goals, but they must also meet the role of team leader. They should therefore have the competence to motivate, solve problems and prevent conflicts and influence employees by giving meaning to their work (Czarnecka, Słocińska 2015, pp. 92-104).

Meaningful work is one that is perceived as "valuable in itself" and at the same time "worth doing" (Rosso, Dekas, Wrzesniewski 2010, pp. 91-127). Such work, on the one hand, helps to satisfy the expectations of the employee related to, for example, development, building relationships. On the other hand, it allows us to create value for important social groups or society as a whole. Feeling the meaning of work requires the employee to look reflexively at the actions taken and assess whether the resulting experience and results are in line with their values and goals (Brach 2020, pp. 294-295).

The issue of the meaning of the work was dealt with by many researchers (see (Baker, Jacobs, Tickle-Degnen 2003, pp. 57-66; Ardichvili, Kuchinke 2009, pp. 155-167; Schnell, Hoge, Pollet 2013, pp. 543-554)). According to the model of the characteristics of the work of J. R. Hackman and G. R. Oldham (1980), describing the determinants of the sense of meaning of work, the assessment of the meaning of work is individual. According to them, the employee, when assessing the content of the work performed in terms of diversity, identity and importance of tasks - concludes about the meaning of the work performed. Criticizing this approach, representatives of the Theory of Social Information Processing argued that an individual never gives meaning to the activities carried out. They pointed out that, in a situation of constant uncertainty about the objectives and the need to coordinate activities in the organization, how the employee perceives his work depends on how others perceive it. The theory of Social Information Processing indicates that in

studies of the sense of meaning in work, it is necessary to take into account the variables that include the opinions of people entering into relationships with the employee, in addition to individual and organizational variables (see Weick, Sutcliffe, Obstfeld 2009, pp. 131-151; Brach 2020, p. 295).

Giving meaning is the ability to perceive meaning, have a unique view and define deeper meaning. It is the ability to think in a way that has not been codified so far, so still activities of this type can't be taken over by computer programs. (Ławicka, Sitko-Lutek 2020, pp. 91-101)

Giving meaning to work, as one of the key competences of a modern manager, is based on a set of skills. One of them are cognitive skills that condition the management of an employee in a way that helps them work effectively and at the same time develop and achieve life satisfaction. The way to effectively fulfil the functions assigned to an employee is dialogue, which should resemble coaching rather than a simple exchange of opinions. If the employee understands what is expected of him, he will find the right way to perform the tasks so as to achieve the goal set for him by his superior. However, the employee should not only understand the manager's expectations towards him, but should also see the sense in taking up the assigned tasks.

The ability to give meaning is also associated not only with proper knowledge of employees, but above all with proper knowledge of oneself. Conversations with employees related to giving meaning to their work are associated with openness in sharing one's own experiences and own understanding of the work done for the benefit of the organization. It is also an indicator of having a distance to oneself, which is a component of a mature personality, manifested in the ability to objectify one's own and other people's behaviour. The effectiveness of management, in addition to substantive competences, i.e., professional knowledge and experience, also depends on the implementation of "soft" areas, i.e., having communication skills, emotional intelligence or openness (Czarnecka, Albrychiewicz-Słocińska 2018, pp. 35-43). Only such a manager is convincing in the role of a mentor who gives work meaning to others.

The above aspects of a manager's work are particularly important in those organizations that go through change processes, which is exemplified by the COVID-19 pandemic situation. These situations are accompanied by quick and often chaotic actions that are not followed by explanatory messages. In the absence of detailed information on how to proceed in new, atypical for the organization and employees, situations, it is he or she who is responsible for explaining the meaning of the activities performed. Employees will follow the supervisor they trust, who is their professional authority, is open-minded and explains to them the organizational reality, even if their actions are burdened with the risk of failure or uncertainty as to the future results of current actions. Moreover, such a management style means that the supervisor does not have to interfere in all aspects of the work, and employees who have greater autonomy in the way of carrying out tasks can be expected to be engaged and non-standard initiatives.

Nowadays, managerial activities related to human resource management are changing, including the management model, evolving towards building employee

relations and supporting employees (Słocińska, Czarnecka 2015, pp. 105-119; Czarnecka, Albrychiewicz-Słocińska, Illes 2018, pp. 122-130). Thus, managerial activities become more aware, responsible, reflective and empathetic. This model fits perfectly into giving meaning as one of the basic managerial competences. Employees who understand the sense of undertaken actions become more independent and effective in them. One can't ignore the fact that doing work that you understand and accept has an impact on your well-being and job satisfaction. This, on the one hand, brings measurable benefits to the employee who changes his own attitudes and behaviours, becoming a more motivated and coping with stress better (compare Isaksen 2000, pp. 84-107; Messias et al. 2021, pp. 139-143). On the other hand, for an organization - an employer, such a situation translates into an increase in business indicators, the level of commitment, safety, retention or innovation, and reduces turnover and absenteeism (Clausen, Borg 2011, pp. 665-681; Rodrigues, Barrichello, Morin 2016, pp. 192-208).

## Methodology

The presented research results constitute a part of a state-wide quantitative research concerning medical workers carried out in terms of the "Research on the opinion of medical workers concerning their functioning in the conditions of the COVID-19 pandemic in their place of work". The study was carried out in December 2020 with the participation of a specialist external company DRB Polonia. The main research problem of the project was formulated as follows: How medical workers perceive their professional functioning in the conditions of the COVID-19 pandemic in the following areas:

- job safety;
- work organisation;
- employee relations;
- satisfaction and sense of work.

The survey was performed using quantitative research methods using the CATI (Computer Assisted Telephone Interview) technique. The research population consisted of medical employees as classified by CSO (Central Statistical Office). The study included a randomly selected representative sample of medical workers  $N = 384$ , determined on the basis of the Central Statistical Office data for 2018. The research sample was selected taking into account the representativeness of the research population in terms of the division into professional groups - doctors, dentists, pharmacists, nurses, midwives, physiotherapists, laboratory diagnosticians, paramedics.

A standardized questionnaire consisting of closed questions and statements was used for the research. A Likert scale was used for the responses, which makes it possible to determine the relative intensity of the different responses. The questionnaire is original and was created by the members of the research team - employees of the Department of Psychology, Sociology and Communication in Management at the Faculty of Management of the Czestochowa University of Technology.

The group of respondents, i.e., 384 medical workers, included: 86 doctors, 12 dentists, 28 pharmacists, 185 nurses, 22 midwives, 26 physiotherapists, 11 laboratory diagnosticians and 14 paramedics. It should not be surprising that such a numerous representatives of the professional group of nurses, which is the most numerous professional group among medical workers.

Most of the respondents (86.20%) indicated their employment status as some form of employment, including 82.03% of persons employed under an employment contract, 3.13% of persons with an employment relationship agreement, and 1.04% of persons on the basis of an appointment. The remaining respondents (13.80%) were employed on the base of a different legal form including: contract (2.08%) people, contract of mandate (8.33%) people, affiliation agreement or an agreement with a different service provider (3.39%). There were 80.73% of women and 19.27% of men among the respondents. The respondents also varied in terms of age, total length of service, as well as length of service in the health service.

The STATISTICA program was used to develop the research results, while non-parametric tests were used to assess the significance of differences in the analysed variables: the Mann-Whitney U test (UMW) and the Kruskal-Wallis ANOVA test (AKW). Numerous statistical hypotheses were adopted in the study: H0 - hypotheses assuming no statistically significant differences in the respondents' statements in relation to the defined independent variables, and H1 - alternative hypotheses about the occurrence of these differences. The strength of the correlations between the variables was determined using the Spearman's rank correlation coefficient. As part of the study, the following problem was raised: how the COVID-19 pandemic influenced the sense of the meaning of work among medical workers in Poland. The meaning of work in the case of the work of medical workers has been defined mainly as helping people.

## Results and discussion

As part of the survey, employees were asked a question about their feelings about the meaning of their work. The answers provided indicate that the majority (as many as 42.19% of respondents) believe that their work definitely makes sense. 31.77% declare that their work rather makes sense, and only 9.37% express the lack of a sense of work. 16.66% of the respondents could not define their feelings in the examined aspect. It should be emphasized that the perceived meaning of work is not differentiated by variables such as: professional group, sex, age, length of service, form of employment, family situation, type of employing unit, its size, location, or the fact that the unit is a public or non-public unit. Such results should be interpreted as the basic feature of the medical worker profession, a specific mission of helping people, especially in a pandemic, regardless of external circumstances.

On the other hand, when analysing the Spearman's rank correlation indicators in relation to the sense of the meaning of the work performed, it should be noted that they correlate with the majority of indicators defined in the research tool. The perceived meaning of work is therefore related to:

- employer's assessment of coping with pandemic conditions in relation to work organization ( $r_s = 0.4131$ , for  $p < .0001$ ), ensuring safety in the workplace ( $r_s = 0.4244$ , for  $p = .0001$ ), maintaining good employee relations ( $r_s = 0.3408$ , for  $p = .0001$ ) and the flow of information necessary for proper functioning in pandemic conditions ( $r_s = 0.3205$ , for  $p = .0001$ ),
- assessment of the sense of security in terms of: availability of disinfectants ( $r_s = 0.4533$ , for  $p < .0001$ ), availability of personal protective equipment ( $r_s = 0.4249$ , for  $p = .0001$ ), organization of the work space (locks, places of isolation, etc.) ( $r_s = 0.3264$ , for  $p = .0001$ ), access to knowledge and information on the COVID-19 pandemic ( $r_s = 0.4191$ , for  $p = .0001$ ), access to knowledge and information on the legal regulations in force at the moment ( $r_s = 0.3691$ , for  $p = .0001$ ), patient management procedures ( $r_s = 0.3788$ , for  $p = .0001$ ), procedures of conduct in other situations at the workplace ( $r_s = 0.4102$  for  $p = .0001$ );
- assessment of the organization of work, the method of managing the unit in a crisis in terms of: adapting procedures to the current situation ( $r_s = 0.4094$ , for  $p < .0001$ ), comfort of work ( $r_s = 0.3645$ , for  $p = .0001$ ), quality of work performance ( $r_s = 0.4241$ , for  $p = .0001$ ), efficiency of work performance ( $r_s = 0.3811$ , for  $p = .0001$ ), availability of knowledge and information on the current situation (organization of meetings, briefings, issuing orders, etc.) ( $r_s = 0.3902$ , for  $p = .0001$ ), participation in the development of procedures ( $r_s = 0.3438$ , for  $p = .0001$ ), decision-making by superiors ( $r_s = 0.3874$  for  $p = .0001$ );
- assessment of relations in the workplace in terms of: support of the employee in the performance of professional duties ( $r_s = 0.4527$ , for  $p < .0001$ ), supervisor's trust in employees ( $r_s = 0.4553$ , for  $p = .0001$ ), the relationship with colleagues ( $r_s = 0.4673$ , for  $p = .0001$ ), employees' trust in colleagues ( $r_s = 0.4573$ , for  $p = .0001$ ), employees' trust in the supervisor ( $r_s = 0.4670$ , for  $p = .0001$ ).

The presented results show that the independent variables describing the characteristics of the organization, in the case of medical workers, do not have a significant impact on the perceived meaning of work. However, the method of managing the unit, with particular emphasis on elements related to personnel management, determines such feelings. Of course, it should be noted here that a group of medical workers is a group of professions based on a certain mission related to helping the patient even at the expense of their own comfort and safety (Wrzesniewski, Dutton, Debebe 2003, pp. 93-135). In this type of work, it is easier to make sense of your actions and responsibilities in the workplace. D. Lepisto and M. G. Pratt (Pratt, Ashforth 2003, pp. 309-327) argue that although employees associate a sense of meaning with a specific experience of work (place, tasks, people), they draw the arguments that justify its meaningfulness from opinions formulated in the public sphere. In the era of a pandemic, medical professionals, especially in the first period, were given special recognition and attention by the public. Although this image worsened with the passage of time and the disclosure of numerous errors and inadequacies in the functioning of the Polish health service in

the public space, during the second wave of cases, employees of these professions still enjoyed support and social recognition.

## Conclusion

The conclusions from the conducted research concern a relatively good image of employers hiring medical workers and the positive impact of elements related to the management of organizations and personnel on the sense of work perceived by employees. It should be noted, however, that when we feel the sense of work, the bond with the company that employs us strengthens so much that we start to treat it as a joint venture, and thus we are inclined to express better opinions about it (Brach, Mazerant, pp. 1-12).

The conducted study, due to the limitations related to its survey character, does not provide clear knowledge of the direction and strength of shaping the aforementioned relations between management and the meaning of work in the surveyed units. However, it should be emphasized that research on the sense of the meaning of work and, consequently, a stronger sense of the general meaning of life play an important role in relation to the functioning of medical workers in the workplace and should be continued and expanded.

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## SUSTAINABILITY IN HEALTH SAFETY MANAGEMENT

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**Abstract:** In the face of today's pandemic challenges, human life and health is an asset of particular importance. The basic assumption of every modern state is to protect life by providing its citizens not only with adequate health conditions but above all with a sense of health safety. In addition to safety, health is a fundamental value that should be pursued throughout life. This article presents selected activities of public authorities concerning health policy in the field of health safety with the example of the Silesian Voivodeship. These activities take place in accordance with the principles of sustainable development. The analysis of documents related to direct actions in the field of the discussed problems was used as a research method to explore the problems of health safety in the context of sustainability.

**Purpose:** This paper aims to analyze and the present selected activities of public authorities concerning health policy in the field of health safety with the example of the Silesian Voivodeship

**Design/methodology/approach:** The research method was the analysis of documents

**Findings:** The analysis of the existing materials, EU projects, and national health policy revealed that the improvement of population health strengthens sustainable development, whereas sustainable development improves health in a cycle supported by an efficient health system.

**Key words:** health safety, health policy, health care, sustainable development.

### Introduction

The concept of the state is defined as a structure designed not only to last but, importantly, to develop in society. Human life and health are values that are strongly interrelated and require special protection due to their value, which is independent of other legally protected goods. Health is a supreme value, which should be cared for throughout life, as reflected by a high level of health safety culture, which is expressed through the identification of health needs and taking action for health. According to the theoreticians dealing with the issues of public health, the maintenance and improvement of health should take place in accordance with the principles of sustainable development, i.e. satisfying current needs without compromising the ability of future generations to meet their own needs. The basic role of every modern country is to protect life as a manifestation of the biological human existence through creating and providing people with good health conditions and health safety.

Based on the events observed in 2020 and early 2021, a number of public institutions have presented statistical data that indicate the need to modify plans to maintain stability and gradually increase public financing of the health care system

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and safety of citizens in the context of the principles of sustainable development. Health care management has become a priority area of government administration. Therefore, health safety is more and more often included in European safety and health programs.

Health safety is defined as a process that allows every person to increase their influence on their health in terms of improving and maintaining good health status<sup>3</sup> (Taranowicz 2010, p.23). Activities of not only individuals but the entire communities are needed in order to ensure physical, mental, and social well-being. Consequently, health safety should be considered from the standpoint of knowledge and resources that humans can utilize in everyday life. Citizens' sense of health safety is determined primarily by the availability of medical services. The basis for health policies that impact health safety in the EU is to implement health promotion policies. Therefore, in accordance with the Article 168 of the Treaty on the Functioning of the European Union, the achievement of a higher level of health protection is one of the most important objectives of the European Union within all European policies and activities. Current EU health policy aims to improve public health, prevent diseases and threats and combat major epidemics, whereas in the current situation, it is the fight against the global COVID - 19 pandemic and the logistical management of the coronavirus vaccination program. It is critical to provide information and promote it through social campaigns and pro-health programs. Poland's accession to the EU made it necessary not only to introduce but also to comply with all EU standards.

The aim of this paper is to present the activities within health policy in terms of health security with the example of the Silesian Voivodeship using the presentation of selected EU programs, as an example of the actions of public authorities implementing the principles of sustainable development. This term was defined and presented in 1987 by G. Brundtland in the report *Our Common Future* (World Commission on Environment and Development). This concept was clarified in two documents adopted in 1992 at the United Nations Conference on Environment and Development in Rio de Janeiro. (Declaration on Environment and Development, Agenda 21: Earth Summit Conference). These documents formulate the recommendations for states and organizations on specific problems to be solved in the implementation of sustainable development (e.g. combating poverty, demographic dynamics, human health protection, environmental protection, management of earth surface resources, waste management, etc.), and are the basis for international, global and regional (cross-border) legislation defining the strategy for sustainable development in a given place (country, region, economic sector, institution). As noted in the paper's abstract, document analysis was used as a research method for the purposes of the study, conducted in 2019-2021. The aim of

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the research was to find an answer to the following research question: which health and EU programs are implemented in the Silesian Voivodeship.

### **Health safety: the origins of health protection activities**

The origins of health care activities can be traced back to ancient Greece when Hippocrates stated that the health of a population was closely related to the environmental conditions in which people lived (Miller et al.202, p.547). It was not until the 19th century (due to the discovery of the microscope in the 16th century) that the sciences of microbiology and bacteriology were established.

In 1848, the General Board of Health was established in London to investigate the causes of the high mortality that persisted among the inhabitants of the great cities following the cholera pandemic. In 1851, the founding International Health Conference was held in Paris to exchange information on epidemic diseases. Research initiated by this Conference led to the establishment of the International Health Organization in Paris in 1907, which became the predecessor of the currently existing World Health Organization, referred to by the abbreviation WHO, which is a specialized organization of the United Nations (established in 1948 with its headquarters in Geneva) (Bsoul-Kopowska 2016, p.250).

These examples of organized collective efforts to combat epidemics of infectious diseases led to the invention of efficient vaccines, implementation of mass immunization programs, and containing the spread of epidemics where they were used (Davies 2010, pp. 624-626). Experience gained in the successful fight against epidemics was taken into account when, at the end of the twentieth century, the science of safety emerged, dealing with, among other things, the identification of existing and potential threats and the possibilities of elimination of their consequences. Therefore, human health and life have been the most important problem and dilemma of mankind for centuries. Therefore, national and international entities performing public administration tasks are obliged to protect life and health.

### **Health safety in EU policies**

The European Union plays a critical role in improving public health, preventing and treatment of diseases, reducing the number of sources of hazards to human health, and alignment of health strategies between member states. The EU has successfully implemented a comprehensive policy in this area using the Health for Growth programme for 2014-2020. The current institutional structure of the EU supporting the implementation of this policy is formed by the European Commission's Directorate-General for Health and Food Safety and specialized agencies, mainly European, e.g. the Centre for Disease Prevention and Control and the European Medicines Agency ([https://ec.europa.eu/health/policies/overview\\_pl](https://ec.europa.eu/health/policies/overview_pl)). EU health policy works in parallel with the national policies of individual member states to

ensure that all people in the EU have access to high-quality health care. The Community activities complement national policies. European health policy involves the development of joint competencies with the member states and the supplementation of national policies<sup>4</sup>. Poland's accession to the EU allowed for the implementation of all EU strategies aimed to improve health safety and the use of EU subsidies. The EU funds made it possible to develop and implement projects presented in Table 1.

*Table 1. Examples of EU health projects*

<b>Project aim</b>	<b>Project description</b>
comprehensive prevention programmes for professional groups	reduction of occupational diseases
comprehensive preventive programmes after a long absence of employees due to occupational diseases	helping workers with occupational diseases return to work
professional training for nurses and midwives	bridging studies
Professional training for physicians, paramedics, and medical emergency dispatchers in the area of emergency medical services.	bridging studies
specialization of medical professionals with deficit specializations: oncologists, cardiologists, and occupational physicians.	medical specialization
professional nursing of the emergency medical services system	postgraduate education
training of employees and managers of hospitals; support of the accreditation of health care facilities, training of National Health Fund managers, the staff of founding bodies, development of qualification standards for managers in the health care sector.	topics: management, tools for restructuring and consolidation of health care institutions, and accounting

Source: M. Warchoł, *Dotacje unijne w latach 2007-2013 a system ochrony zdrowia w Polsce*, Journal of Education, Health and Sport 7 (5), pp. 401-409.

### **Management of health of the inhabitants in the Silesian Voivodeship**

The Silesian Voivodeship can be defined as a specific area in Poland due to historical and environmental conditions, facing challenges connected with a high population density and negative demographic forecasts.

There were 4.635 million people living in the Silesian Voivodeship as of July 2019, which accounts for 12.14% of the country's population. The urban population is also decreasing, while the rural population in terms of the number of people per 1 km<sup>2</sup> in Poland is on the increase (368 people/km<sup>2</sup> in 2019 according to the statistics of the Central Statistical Office). The Silesian Voivodeship is the most urbanized (77% of the urban population) and the most densely populated region in Poland. The

population of the Silesian Voivodeship is also characterized by higher dynamics of population aging than observed nationwide, which is mainly caused by low birth rates and lower female fertility. Environmental factors also play an important role, including high emissions of dust and gas pollutants (2nd and 3rd place in the country), land degradation resulting from the high level of economic use of the voivodeship's resources, and long-term activity of industries that adversely affect both the environment and the health of residents (Priorytety 2019).

Based on the analysis of the value of the average life expectancy of a newborn at birth, the data concerning the health of the inhabitants of the Silesian Voivodeship are among the worst in the country. The comparison of premature mortality rates (0-64 years) compared to nationwide parameters is also unfavorable. The actual number of deaths per 100,000 people places the Silesian Voivodeship on the third-highest level in the country. In the case of COVID-19 in the Silesian Voivodeship, factors conducive to the occurrence of larger outbreak clusters also include conditions associated with the phenomenon of the depopulated cities and the process of trans-industrialization. The most common causes of death in the Silesian Voivodeship are cardiovascular diseases, malignancies, external causes of morbidity and mortality, digestive and respiratory diseases, and, currently, COVID-19.

The Silesian Voivodeship is characterized by high density with medical infrastructure (a large number of hospitals, hospital beds). However, the highest concentration of health care units can be seen in the area of the Upper Silesian urban complex. The following documents were used to conduct the diagnosis which is an important element of defining the state of the discussed region, its position, and problems: Map of health needs in terms of hospital treatment for the Silesian Voivodeship (Mapa potrzeb zdrowotnych), long-term goals resulting from the "Policy paper for health care 2014-2020; National Strategic Framework" (Zdrowie-aktualności) and epidemiological demographic indicators, expert knowledge of consultants, and local experience (Priorytety). The data obtained from these documents have been taken into account in the "Priorities for regional health policy in the Silesian Voivodeship". The emphasis was put on "the development of comprehensive and coordinated care in all areas, especially in the field of long-term care, oncology care, mother and child care, psychiatric care, care for the elderly, increasing the quality and comprehensiveness of services in outpatient care, reducing the consequences of the adverse demographic situation" (Priorytety). The established priorities are also in line with the Development Strategy of the Silesian Voivodeship Śląskie 2020+.

There are also Regional Operational Programmers' in the Silesian Voivodeship which were created as a result of many years of observations and analyses. They allowed for the diagnosis of the areas at particular health risks for the Silesian residents and the causes for these risks.

The Regional Operational Programme allowed for co-financing activities aimed at labor activation through proper health care. A package of seven Regional Health

Programmers' worth nearly £93 million was developed in 2019. In 2021, some EU-funded projects are worth noting. For example, "Onco-Yoga" project (for oncology patients) consists of supporting and raising awareness of the recovery process that is influenced by the patient himself, using his or her physical activity, healthy diets, and way of thinking. The patient needs not only medical therapy but also psychological and social support. Another project, "Support for anesthesiologists", involves equipping doctors with muscle relaxation modules (NMT). The anesthesiologists using the module will be confident that their patients are safe during the procedure. Supported by EU funds, *doctors from the Oncology Centre in Gliwice can treat cancers that have so far been considered incurable, using innovative interventional radiology procedures, whereas pregnant women can be tested for fetal heart rate, pulse, uterine muscle contraction activity, and fetal movements at home.*

With EU funds, a portable, fast and ultra-sensitive device for detecting SARS-CoV-2 will soon be available in Silesian hospitals. European funds are actively supporting the fight against COVID-19. For example, a project is being implemented to reduce risk factors in the work environment resulting from the contact with a patient infected or potentially infected with the Sars-Cov-2 virus, through securing the employees (e.g. of medical entities and units of the state emergency medical services system) with modern equipment to effectively combat the COVID-19 pandemic. Also noteworthy is the project Silesian Program for Mental Health Protection for 2019-2022, which aims to take extensive measures to promote mental health and prevent mental disorders (related to the pandemic) of the inhabitants of the Silesian Province. The biggest challenges in the context of health care concerning the Silesian Voivodeship include increasing access to specialist medical services, limiting the occurrence of occupational diseases, increasing life expectancy, and slowing down the population aging.

## Conclusion

Identification of the priorities for regional health policy in the Silesian Voivodeship represents an attempt to define more precisely the ways of acting, their effects, the measures of these actions to achieve specific operational objectives and health benefits for the inhabitants of the Silesian Voivodeship. All the priorities mentioned above are guided by a long-term strategic objective, which is to improve the health and quality of life of the Voivodeship population. These priorities define the directions of achieving the objectives. Therefore, it can be expected that their implementation will result in many positive changes in the state of health of the population, including e.g. changes in lifestyles of the population and reduction of inequality in access to health services. The analysis of the statistical data, current documents, implemented EU projects, and health policy objectives leads to the conclusion that these actions are aimed at ensuring universal access to prevention

and health services and increasing the quality of medical services while maintaining equal rights for all, which will help increase health safety and improve living conditions in the Silesian region despite the fight against the pandemic and the introduction of continuous changes in health care. The region has a number of high-level health care units equipped with modern specialized medical devices and highly-qualified medical staff. Particular attention should be paid to the most successful facilities in the fields such as oncology, cardiac surgery, rehabilitation, emergency medical services, and burn treatment. Units that deal with these areas of medicine in the region are at the top of national rankings.

Due to the constantly introduced changes as a response to the dynamic pandemic situation in the country, the paper presents only a part of the analysis of the documents related to the problems of health safety management in the Silesian region. However, the analysis of the existing materials, EU projects, and national health policy revealed that the improvement of population health strengthens sustainable development, whereas sustainable development improves health in a cycle supported by an efficient health system. Consequently, the concept of a sustainability model is being developed, in which health plays a role of a factor ensuring the permanence of actions taken.

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# THE IMPACT OF DIGITAL TRANSFORMATION ON INNOVATION MANAGEMENT

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**Abstract:** Digital transformation is a specific organisational change resulting from the evolution of new information and communication technologies. The digital technologies that are most significantly changing not only business models but also innovation management are: social media, mobile technologies, analytics and Big Data, cloud computing and the Internet of Things. Over the years, innovation has become open, global, and collaborative in nature and involves diverse stakeholders and distributed innovation processes.

**Purpose:** The aim of the research was to find answers to the following research question: How does digital transformation influence the realization and effectiveness of the innovation processes? In addition, the digital technologies that have the greatest impact on the effectiveness of each stage in the innovation management process were identified.

**Design/methodology/approach:** An interview method with managers of large enterprises was used.

**Findings:** Research has shown that the use of appropriately selected digital technologies to implement particular stages of innovation creation increases the effectiveness of these processes. The study has proven that digital transformation facilitates the creation of collaborative innovations. The research also proved that focusing on customers and creating innovations that meet their needs allows companies to increase their competitiveness.

**Key words:** digital transformation, innovation management, digital technologies

## Introduction

Implementation of new technologies, digitization of data, and automation of processes are no longer just a lever for growth, but a precondition for survival and competitiveness of companies. The digital revolution has greatly accelerated in recent years, and, despite the difficulties caused by the COVID-19 pandemic, spending on digital transformation technologies and services has increased by more than 10 percent. (IDC 2019). Therefore, the resilience of this market to unpredictable economic fluctuations shows how much importance companies attach to the digitization and how high their expectations are. According to the 2020 Veeam report, nearly one-third (30 %) of businesses around the world are beginning to conduct or at least plan digital transformation.

The Digital Transformation of Companies survey conducted at the request of EY by CubeResearch in October 2020 (sample of 989 respondents) shows that according to 57% of respondents, the pandemic has accelerated the digital transformation of Polish companies. The vast majority of entrepreneurs (82%) confirm that digital transformation is an evolutionary but inevitable process, the implementation of

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which requires a change in mindset and many previous habits. Nearly a quarter of respondents (22%) rated their company's digital transformation as advanced, while just over half (55%) rated it as medium. A low level of digital transformation was indicated by 23% of respondents (Transformacja...2020). The presented results also confirm that one of the objectives of digital transformation is to meet customer needs, which is associated with the development of business innovation. The use of different information technology solutions in innovation management is practiced in many companies, However, it is worth including the digitization of innovation management processes in the strategy of digital transformation of business processes. The following stages were distinguished in the process of innovation management: search, select, implement and capture value and benefits. Of many ICT solutions, those that managers believe should be used to support each stage of the innovation management process were selected. The paper presents the concept of using ICT solutions as a support for innovation processes management.

The research aimed to find answer to the following research question:

How does digital transformation influence the realization and effectiveness of the innovation processes? Furthermore, the digital technologies that have the greatest impact on the effectiveness of each stage in the innovation management process were identified.

### **Literature review**

Digital transformation is the process of making disruptive changes in approaching customers and conducting business, using digital technologies and leading to innovative products, services, processes, or business models (Digitalizacja 2019). The determinants of taking up the challenge of digital transformation in a company include the expectations of customers towards new communication channels and access to services, the expectations of managers towards improved meeting and anticipating customer needs due to transformation of business processes, and the expectations of employees, who want to improve the conditions of their employment.

The main inspirations for Polish companies to start digitization are changing customer expectations and the availability of new technologies (Jelonek, Turek 2019).

In this context, it is unsurprising that companies are increasingly interested in implementing new digital technologies and plan such investments in their budgets. According to the 2019 IDC forecast, direct investment in digital transformation will reach \$7.4 trillion between 2020 and 2023.

Enterprises expect that the sequence of changes that every organization has to undergo during the digital transformation process will make them more agile, more innovative, and ultimately more competitive in the market. Outcomes of digitization include advanced tools for better, faster, and more efficient customer service or collecting, analyzing, and using data from different sources.

Digital transformation means business transformation. This aspect was highlighted by the following definition: digital transformation is a specialized type of business transformation where IT plays a dominant role. In the digital age, new business opportunities arise and enterprises transform their strategy, structure, culture, and processes using the potential and power of digital media and the Internet (Uhl et al. 2016, p.15).

In the literature, problems of digital transformation have been widely discussed in relation to digital transformation strategies (Matt, Hess, Benlian 2015), digital transformation of business models (Schallmo, Williams, Boardman 2020), digital dividends, and entrepreneurship (Galindo-Martín, Castaño-Martínez, Méndez-Picazo 2019), and digital transformation of innovation (Herbert 2017; Nambisan, Wright, Feldman 2019).

The speculation that innovation in the broad sense should be one of the main goals of digital transformation was confirmed by a study conducted by Digital Academy (2020). While responding to the question: “What should be the main Focus while conducting a digital transformation?”, respondents indicated innovation as the third objective (16% of indications), just after focusing on data (18% of indications) and focusing on customer needs (52% of indications).

Digital technologies promote openness in varied ways, and consequently, digitization has radically changed the notion of innovation and open innovation models. Internet and social media play a special role in the emergence of new models of innovation creation (Jelonek 2012). The innovation process consists of many diverse activities carried out in an orderly manner that enable the realization of a specific innovative idea and its transformation into a new state. The first stage of this process is to search, i.e. recognize market expectations and analyze emerging opportunities for change. The next stage is to select ideas for possible change, including the creation of innovative ideas and the decision to implement them. The third stage is to implement innovative projects and confront the ideas with real production capabilities. The last stage of the innovation process is to discount the value of the implemented innovative project (the capture stage).

The impact of digital transformation on innovation management at each stage (search, select, implement, and capture) is a research problem whose solution was sought in the author's study.

## **Methodology**

An interview method with managers of large enterprises was used. Respondents were: 4 executives responsible for R&D departments and 1 manager responsible for customer relations. Telephone interviews were conducted in March 2021. The scenario of the interviews was the same for everyone. The questions were as follows:

Which ICT solutions are most commonly used in customer interactions?

Which ICT solutions are most effective when creating innovation?

Is cloud computing used, and if so, how, in the four stages of innovation management?

Is social media used and if yes, how in the four stages of innovation management?

Is mobile technologies used and if yes, how in the four stages of innovation management?

Is Big Data used and if yes, how in the four stages of innovation management?

## Results and Discussion

All respondents agreed that the following technologies are the most important in managing innovation: Cloud Computing, Social media, Mobile, and Big Data. They were then asked about the possibility of using each technology in stages of innovation management process: search, select, implement and capture. The most interesting answers of the respondents are presented in the table 1.

**Table 1. Possibilities of using digital technologies at the innovation management process**

Stage	Examples of using digital solutions
<b>Cloud Computing</b>	
Search	Use of platforms from Cloud Computing providers Use of platform by customers
Select	Collaboration among internal and external clients anytime and anywhere e.g. virtualization. Use of platforms from Cloud Computing providers
Implement	Real-time data processing, access and storage of information on as-needed basis (PaaS, HaaS)
Capture	Storage and distribution of information with stakeholders in ecosystem
<b>Social Media</b>	
Search	Source of customer sentiment Source of information about new trends Creating a community of innovators
Select	Customers share experiences in evaluating new products and services
Implement	Direct customer communication and interaction for marketing Voting of prototypes
Capture	Enhancement to CRM practices Source of customer sentiments (positive/negative)
<b>Mobile</b>	
Search	Information based on location data
Select	Access and collaboration among stakeholders across various location.
Implement	Providing access to information through mobile devices. Location-based information. Augmented reality can enhance customer experience.
Capture	Direct accessibility to customer anytime, anywhere.
<b>Big Data</b>	
Search	Analyzing unstructured data Data analytics can be used to identify trends from primary data
Select	Customer segmentation via automated cluster analysis, Analyzing unstructured data
Implement	Broad decision support and automation that increase time- to-market.

Capture	Real-time analysis of customer sentiments and behavior, e.g. visualization of results
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Source: Own elaboration based on interviews

## Conclusion

In recent years, the nature of innovation has undergone dramatic changes in the majority of industry sectors. Innovation has become much more open, global, more frequent, unpredictable and also collaborative in nature involving often a diverse partners.

Digital technologies play a crucial role in enabling innovation strategies towards a digital transformation. Social media, mobile, Big Data, Cloud Computing are the most important digital technologies that can be employed to enable innovative solutions with respect to each phase of the innovation process.

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# BURNOUT AMONG PUBLIC ADMINISTRATION EMPLOYEES DURING THE PANDEMIC

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**Abstract:** Burnout is an increasingly common phenomenon among employees. Its level is influenced, among others, by workload, competition, applying for promotion, higher salary, prestige or social respect. The recent pandemic and the widespread remote work in administration include: fear for the health and life of one's own and family members; fear of losing your job, and thus your source of income; the need to learn how to use new tools, applications, communicators; the need to reconcile many roles and the resulting responsibilities (e.g. caring for relatives - children and sick parents; caring for the home - shopping, cleaning, cooking, washing, etc.) professional work.

**Purpose:** The aim of this article (in the theoretical part) will be to present the essence of burnout syndrome, along with its most common causes, symptoms, as well as how to prevent and counteract it. On the other hand, in the empirical part of the study, the level of burnout of the described professional group during the partial lockdown during the covid-19 pandemic will be determined on the example of research conducted in a local government administration unit.

**Design/methodology/approach:** The research method was a survey, a sent (e-mail) survey technique, and a survey questionnaire was the tool.

**Findings:** It has been reported that 27.3% of the respondents who are employees of a public administration unit are at the 5th (maximum) level of occupational burnout; 21.2% on level 4; and 30.3% at level 3 (feeling burned out). The main reason for burnout is: overwork + excess duties + professional stagnation = 78.8% of respondents' indications. On the other hand, the basic factors minimizing occupational burnout are: relaxation / rest (more often indicated by women), and hobbies / interests (favored by men).

**Research limitations:** The research was carried out using an electronic form sent by the secretariat via e-mail, to which only volunteers replied.

**Practical implications:** Counteracting burnout in the studied unit and helping to identify, prevent or counteract it in others.

**Social implications:** Work-live balance ("healthier" relationships in families); reduction of outlays for the treatment of employees and costs related to their absenteeism improving the atmosphere at work; quality of work (including customer service).

**Key words:** burnout, public administration, covid-19 pandemic.

## Introduction

Burnout syndrome usually occurs in a situation of prolonged work-related stress that the individual cannot deal with. The occurrence of this phenomenon is especially favored by work in professions, the specificity of which consists in direct contact with people, e.g. working in the health service (doctors, nurses, orderlies, rescuers and others); fire brigade employees; the police; troops and similar professions that cannot be performed only remotely (on-line).

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Initial emotional involvement in work motivated by e.g. with the right thing, social respect, makes the employee more efficient than it used to be on a daily basis, which usually results in burdening him with new duties. However, if such a stressful situation, in which human life is often at stake, protracts in time and is additionally accompanied by the pressure of the result combined with work overload, as a result of which private life obligations are neglected, as well as the lack of recognition and adequate remuneration, then it is likely that such an employee will experience burnout.

Long-term performance of responsible, stressful, physically overloading work, without specific compensation (money, vacation, promotion), makes the so-called soft measures of motivation (e.g. praise from the superior) become ineffective, especially when the results of work from the employee's perspective are mediocre and external criticism appears. All this ultimately results in a loss of personal commitment, i.e. burnout in the profession.

Working in conditions of constant stress (especially in the conditions of the crisis such as the covid-19 pandemic) and the need to comply with the adopted procedures and regulations, make employees less flexible and creative, which leads to lower self-esteem, deterioration of health (initially mental, then physical) as well as decreased performance.

The general decrease in energy and the level of commitment also negatively affects the number and quality of contacts with served customers. Due to their own ailments, the employee ceases to notice the problems and needs of other people, ignores them and hyperbolizes their own. In addition to the decline in the quality of the services provided, the decline in psycho-physical condition results in greater susceptibility to depression, which in turn leads to escape to alcohol, drugs, drugs, etc.

Burnout generates a number of social effects, such as: treatment costs (mental and physical); possible family tragedies and relationship breakdowns; accidents at work and the need to pay compensation; or in this context, the most trivial drop in the quality of customer service.

The time of the pandemic crisis particularly intensified the occurrence of the discussed phenomenon of occupational burnout in organizations. Only a quick and at the same time accurate diagnosis of burnout allows you to take appropriate measures to prevent or combat this syndrome and its effects.

### **The phenomenon of occupational burnout - characteristics, causes, prevention**

Burnout as a phenomenon can be analyzed on many levels, as it is an interdisciplinary issue, mainly in the field of psychology (clinical, social, work, personality) and management (HRM, organization).

According to literature sources, the author of the term *Burn-Out* is Graham Green, who in 1961 was the first to use this term to name the phenomenon he describes. (Green, 1961) On the other hand, Hubert J. Freuberg is considered to be the creator

of the *burnout syndrome*, who in 1974 characterized the clinical patterns of burnout from the psychoanalyst's point of view. (Freuberg, 1974)

Particularly noteworthy are the works of Christina Maslach, who, although in 1981 together with Susan E. Jackson, developed a tool to measure occupational burnout (Maslach Burnout Inventory – MBI), it was only in the 90s that this psychologist managed to popularize in-depth research on occupational burnout among people representing professions related to social services, as well as helping other people.

Ch. Maslach defined occupational burnout as a response of the human organism, which functions in conditions of mental overload of professional work. Describing the phenomenon of burnout at work, the author draws attention to its three components: emotional exhaustion, depersonalization, and a decrease in the assessment of one's own achievements, as shown in *Table 1*.

**Table 1. Characteristics of the components of occupational burnout according to Ch. Maslach.**

	Components / indicators of occupational burnout		
	emotional exhaustion	depersonalization (dehumanization)	decrease in the assessment of own professional achievements
characteristics of the phenomenon	tiredness and the feeling that you can no longer give anything more of yourself to others	attitude of indifference to others, impersonal treatment, negative / soulless attitude towards people (who need help)	viewing your own work in a negative light; loss of satisfaction and commitment to professional work
symptoms	decreased activity, feeling of psycho-physical fatigue, pessimism, irritability, discouragement to work, constant tension, lack of interest in professional matters	an attempt to distance oneself from problems concerning people from the environment, which is expressed in short and formalized contacts, distance, reduction of involvement in relations with people from work; cynicism and blaming others for their failures	feelings of defeat, low self-esteem, loss of effective problem-solving ability, aggression and even leaving work

Source: own study based on - Ch. Maslach, *Wypalenie się: utrata troski o człowieka*, [in:] P.G. Zimbardo, F.L. Ruch, *Psychologia i życie*, Wyd. Nauk. PWN, Warszawa 1994, s. 52.

Polish scientist Helena Sęk uses a similar context as Maslach. He states that people working in professions with close interpersonal contact and commitment, such as a doctor, nurse, therapist, teacher, policeman, priest, social worker, manager, etc. are particularly exposed to burnout. Psychological stress is part of the specificity of the above-mentioned professions, the continuous and long-lasting operation of which destroys the employee's body. Commitment to work means that the employee

gives more of himself to others than he receives himself, and therefore his mental and physical resources decrease and burn out. (Cherniss, 1993) This is especially true for ambitious people with lofty goals, motivations, advancement, and a need for social significance. (Şek, 2009, s. 84) (Ober, Karwot, 2017, s. 284)

Burnout (as opposed to trauma) occurs gradually as a result of fatigue, frustration and anxiety. Long-term presence of the above-mentioned leads to a state of depression, isolation and escape (e.g. into drugs, the virtual world, or a change of place of residence or work).

As mentioned before, the burnout syndrome occurs as a result of disproportions between workload, requirements, expectations and individual abilities to the amount, type and time of their endurance. (Litzke, Schuh, 2007, s. 167)

Basically, the causes of burnout can be grouped into three types: individual (personality, demographic, attitudes towards work); interpersonal; organizational. This breakdown is presented in detail in *Table 2*.

**Table 2. Causes of occupational burnout**

<b>Individual</b> (specific employee)	<u>personality</u> : insecurity, passivity, dependence, low self-esteem, defensiveness, psychopathic traits, immaturity, hysterical traits
	<u>demographic</u> : youth, higher education, loneliness, gender ("exhaustion" in women, "depersonalization" in men)
	<u>attitudes towards work</u> : - wholehearted commitment to work, - high expectations of oneself, - negating own load limits.
<b>Interpersonal</b> (employee - client, employee - manager, employee - associates)	<u>employee-client</u> - too much emotional involvement in the problems of the served persons;
	<u>employee -manager</u> - bad communication;
	<u>employee- associates</u> - jealousy and rivalry (satisfaction with the failures of others).
<b>Organizational</b> (working conditions)	- excessive workload, inability to cope with tasks,
	- inability to exercise control over the work performed,
	- insufficient remuneration in relation to the workload,
	- conflicts and lack of a good atmosphere at work, undermining competences,
	- lack of justice in the workplace, discrimination or favoritism, lobbying,
- conflict of values, discrepancy between the goals of the organization and the employee.	

Source: own study based on - (Terelak, 2005, s. 229), (Grunt-Mejer, 2012), (Maslach, Leiter, 2011, s. 35-36), (Pabian 2017, s. 10-11), (Ober, Karwot 2017, s. 284) oraz (Hołyst 2013, s. 296).

As can be seen from the reasons for the occurrence of the burnout syndrome presented in *Table 2*, they may be dependent or independent of the employee. This is because burnout, although largely dependent on the psychological characteristics

of the individual himself, is no less influenced by the environment in which a person has to work.

Since the causes of burnout are external and internal, the responsibility for counteracting it is the same. Referring to the observations of S.M. Litzke and H. Schuh, the organization, management and employees (in relation to themselves and colleagues – *Table 3*) are responsible for preventing or preventing burnout from occurring. (Litzke, Schuh, 2007, s. 175-176)

**Table 3. Subjects and areas of occupational burnout remediation activities**

<b>organization</b>	relieving employees, incl. by: appropriately longer breaks at work, shortening the length of shifts, holidays, rotations, incomplete hours,
	adjusting the system of own needs to the system of employees' needs - a matter of interests, autonomy and participation
	flattening the hierarchy and delegating responsibility - improving motivation, communication and eliminating conflicts
<b>managers</b>	giving employees a model of behavior by their attitude
	providing the employee with the rationale and value of his actions (appreciation, assigning a role) and support in achieving goals
	not burdening urgent workers with additional tasks
	irresistible praise and recognition
	creating a friendly atmosphere in the workplace
<b>employees</b>	setting priorities at work
	distinguishing the requirements set by the organization from those imposed on itself (saving time and overload)
	commitment and success in the team (results in respect of colleagues)

Source: own study based on – (Litzke, Schuh, 2007, s. 175-176).

In addition to the measures listed in *Table 3* for combating burnout, the following are mentioned: employee's access to psychological, physical, social and organizational resources offered by the place of employment (Grunt-Mejer, 2012); taking care of the psycho-physical health of the employee both by himself and the organization; having non-work related interests; separation of private and professional life; and keeping a distance to business tasks (Simpson, 2013, s. 187- 201).

## Methodology

The research was conducted in March 2021, when remote work was in force and security rules were tightened due to covid-19. (<https://www.gov.pl/...>) The place of the survey was one of the commune offices in the Śląskie Voivodeship (in Poland).

To collect the data, a survey questionnaire consisting of 20 questions (plus a record: gender, age, length of service) was used, which was sent to the respondents electronically (e-mail) by the secretariat of the examined institution (due to the difficult pandemic situation, pilot studies were abandoned). The survey questionnaire used a five-point Likert response scale.

33 people answered the questionnaire correctly: 25 women and 8 men; aged 25 to over 50 years of age; with work experience from 1-3 years to over 20 years.

The main aim of the study was to determine the level of burnout of the described occupational group during a partial lockdown during a pandemic. The specific objectives, on the other hand, concerned the identification of the main causes (areas) of burnout and the methods of prevention.

## Results

When asked about the level of their own professional burnout, the respondents indicated answers which, quantitatively and in correlation with the length of service, are presented in *Table 4*.

**Table 4. Level of occupational burnout**

Burnout level (1 - no burnout, 5 - complete burnout)	Nr of responses in % (N = 33)	Seniority
5 – complete burnout	27,3 %	over 20 years – 15,2 %; 11-20 years – 9,1 %; 6-10 years – 3,0 %
4 – on the verge of exhaustion	21,2 %	over 1 year, and under 6 years of age
3 – feels exhausted (warning level)	30,3 %	
2 – observes the occasional first symptoms	18,2 %	
1 - she had never seen such symptoms in her life	3,0 %	over 1 year, and under 3 years

Source: own study of the research carried out.

In the five-point Likert scale, as many as 48,5 % of respondents subjectively feel *extreme exhaustion* (4) or *complete burnout* (5), and 30,3 % *feel exhausted* (level 3). Only about 20 % of respondents say it is *completely or relatively free from burnout*.

The main reasons for the appearance of this syndrome were indicated by the respondents as in *Table 5*.

**Table 5. Causes of occupational burnout**

Cause of burnout	Number of responses in % (N = 33)
changing the specifics of work from stationary to remote	24,2 %
overwork + excess duties + professional stagnation	78,8 %
excessive involvement in office work	36,4 %
stress in the work environment	63,6 %
lack of motivation to work	54,5 %
irritation	33,3 %
depressive moods	42,4 %
anger and resentment	9,1 %
sleep disturbance	18,2 %

Source: own study of the research carried out.

The combination of *overwork, excess duties and professional stagnation* was indisputably recognized (78,8 %) as the main cause of burnout.

The top three, with the result of more than half of the responses, also included *stress in the work environment and lack of motivation*.

The level of general satisfaction of the respondents with the work performed is presented in *Table 6*.

**Table 6. Job satisfaction**

<b>Job satisfaction</b> (1 - no satisfaction, 5 - complete satisfaction)	<b>Number of responses in% (N = 33)</b>
1 - lack	15,1 %
2 - low level	30,3 %
3 - average	45,5 %
4 - noticeably	9,1 %
5 - complete	0,0 %

Source: own study of the research carried out.

The vast majority of respondents, 45,5 %, describe their job satisfaction as *average* (3). It is disturbing, however, that a similar amount (in total) feels its *lack* (1), or estimates it at a *low level* (2). Only 9,1 % of the respondents are *noticeably* (4) satisfied with their work, and no one marked *complete* (5) satisfaction.

In addition to the issues presented in *Tables 4-6*, the respondents were asked about the factors minimizing occupational burnout. In the first place there was relaxation / rest (indicated by about half of women and about a quarter less often by men), and hobbies / interests that men favor (about 50 %) and about ½ less often women. Only one (out of 33) respondents admitted that they use alcohol or drugs to minimize burnout.

## Discussion

In the available studies, there are various ways of understanding burnout (e.g. as a phenomenon in the work environment or as a disease - a clinical approach), and therefore identifying various factors that shape it. There are more and more research tools (questionnaires) used by various countries, organizations or scientists. They are given abbreviations derived from the full names (e.g.: MBI, LBQ, CBI, OLBI, SMBM, SQT, BODI, BAT, and other), in which the significance of the impact on occupational burnout is attributed to various degrees to various factors. (*Eurofound*, 2018)

The presented lack of unanimity among scientists causes a number of difficulties related to the comparison of this phenomenon in different countries at the methodological level without entering professional divisions yet.

Research from July 2020 by Monster (an online employment platform) shows that, despite occupational burnout, fewer and fewer people (59 % compared to the pre-

pandemic situation) take their vacation. Moreover, 42 % of people still working at home do not plan to take time off from work to regenerate. People seem to forget that a mental break from work is extremely important and can prevent burnout. (Monster, 2020) The results of these studies seem to be in contradiction to the responses of the respondents of the research presented in this study, who indicated rest, relaxation, developing interests, and practicing hobbies as a way of coping with burnout. This difference may result from the fact that people working in public administration are highly qualified, hence their fear of finding their way in the labor market is not that high.

Although there are differences in the methods of studying burnout and the results of these studies, there is also some agreement among scientists, and it concerns the fact that burnout most often affects people characterized by over-commitment and ambition, highly motivated, and setting high expectations. and striving for perfectionism. (Krawczyk-Sokołowska, 2008, s. 272) (Sęk, 2009, s. 84) (Hołyst, 2013, s. 296) (Ober, Karwot, 2017, s. 284)

## **Conclusion**

Almost 80 % of respondents have a problem with burnout, taking into account levels from 3 (feeling exhausted) to 5 (complete burnout). The level of burnout correlates with the seniority of the respondents (which confirmed the adopted research assumption): the longer the seniority, the higher the burnout level.

The results of the conducted research allow to conclude that the employees of the local government administration, despite the change in the way of working to the remote one as a result of the covid-19 pandemic, see this as the cause of burnout to a relatively low degree, because only about a quarter of the respondents. This could indicate that the vast majority of these employees are well trained, equipped and have no problems with operating modern equipment and applications for remote work.

The main causes of burnout, on the other hand, are perceived by the respondents as overwork, excessive duties and professional stagnation, i.e. heavy monotonous, routine work in a position without the possibility of promotion. In addition, stress in the work environment (which may result from errors related to human resource management, as well as concerns about health and work, and the ability to combine work at home with taking care of the household and loved ones, in particular children in the situation of covid-19), lack of motivation (resulting from low salary and focus on survival in the conditions of a pandemic crisis) and depressive moods (42,4 %), which should be considered a highly worrying symptom, the cause of which can be seen in lockdown, associated with closing at home and limiting social contacts.

Relaxation and having a hobby allow you to slightly reduce the level of burnout, but due to low earnings, they cannot be too fancy, and thus give you complete satisfaction.

As for job satisfaction, it was assumed in the research that it would correlate with the level of occupational burnout, but this was not entirely confirmed. Although only

about half of the number of people who are completely burned out at work declare a total dissatisfaction with work, summing up three analogous levels, it turns out that the overall level of job dissatisfaction is higher than the level of occupational burnout. Hence, it can be concluded that along with the work experience, a group that does not derive any satisfaction from it will join the professionally burned out.

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## **SECTION 3:**

### **New Trends in marketing and Financial Management**

# IDENTIFICATION OF THE ASSETS AND CAPITAL STRUCTURE OF FOREST ENTERPRISES IN SLOVAK CONDITIONS

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**Abstract:** Long-term observations indicate that the impact of climate changes is adversely affecting the forest ecosystems, it changes the structure of forest stands, their tree species composition and the quality of wood raw material. Due to this fact, it is also possible to expect a change in the forestry enterprises efficiency. Forest enterprises can increase the efficiency by increasing their profits that is by revenue growth or costs reduction. This is quite problematic due to the high proportion of incidental fellings and the low average monetizing in recent years. The goal of this paper is to clarify some specifics which affect the management efficiency on forest land, assets and capital structure of forest enterprises efficiency and possible increasing of foreign sources funding, to enhance the forest enterprises efficiency. Our research is based on the rules of optimal financing and the relationship between profitability and debt on the principle of decomposition of profitability and leverage effect. The results of the paper identified an issue that forest enterprises losing an opportunity for development and economic growth because of the lack of foreign investments and foreign capital. Furthermore, an implementation of modern technologies is also insufficient, which means enterprises losing a competitive advantage.

**Key words:** Efficiency, Financing, Forest enterprises Debt, Profitability

## Introduction

The main object of forestry is to adopt of innovative bio-based approaches in terms of global changes. Nowadays forestry meet many challenges to deal with. Long-term observations show that the impact of climate change is adversely affecting forest ecosystems and the structure of stands, trees composition and the quality of wood mass are also changing (Andersson, Keskitalo, Lawrence 2017). Moreover, this situation is complicated by the rising intensity of incidental felling due to windthrow (Gejdoš, Potkány 2017). Above all, it is important to mention number of forestry specific features. Especially an extremely long production cycles, relatively short working hours, the seasonal nature of timber harvesting, polyfunctionality of forest production, limitation of natural capital and also forest law enforcement (Alonso-Ayuso et al. 2018, Hajdúchová et al. 2011, Hajjar et al. 2011). One of the most important tasks of the forestry sector in conditions of the green economy in order to maximize the contribution of forests to climate change mitigation and to improve the quality of life, are represented by ecosystems services which should be adequately compensated (Báliková et al. 2019, Neykov et al. 2020a). Another assessing issues in forestry involved macro environment which means social, political, economic and technological contexts (Badini, Hajjar, Kozak 2018, Neykov et al. 2020b). Furthermore, the forestry sector is an important feature

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in sustainable employment in rural areas (Neykov, Antov, Savov 2018). Even though forest enterprises face to challenges already mentioned above its objectives are sustainable logging at the maximum possible volume with an effort to maximize profits for a long period. Due to unpredictable circumstances that occur daily, it is also possible to expect a change in the performance of forestry enterprises. Furthermore, the current widespread outbreak of the COVID-19 pandemic posed new challenges to enterprises, recently investigated by Hitka et al. (2021), which made resolving the trivial problems more topical in order to sort out the new ones. The aim of our paper is to contribute to the identification and quantification of assets and capital structure which affect performance of forest enterprises and the effect of financial leverage. Moreover, the findings will contribute to the identification of potential opportunities and reserves for further development and growth, in the context of the green economy principles. An increase in the performance of forestry enterprises will result in the subsequent grow of entire forest-timber sector.

### **Literature review**

One of the difficult issues that enterprises to meet the challenge is the choice of capital structure. The optimal capital structure of a firm is the best mix of debt and equity financing that maximizes a company's market value while minimizing its cost of capital (Tian 2016). There is no way to discuss optimal firm's capital structure without explaining the MM theorems (Singh 2016). Propositions implied that the weighted average of costs of capital to a firm would remain the same no matter what combination of financing sources the firm actually chose (Modigliani, Miller 1958, Miller 1998). Later research conducted by Brealey et al. (2018) showed, that value of the company is not determined by debt to equity ratio, but with the value of the company. Based on (Abeywardhana 2017) MM is only abstraction. In the real world there are taxes, tax shields, transaction costs, non-public information, and complex patterns of corporate growth that all influence financial value depending on a company's capital structure. Later, the authors themselves recognized the impact of income taxes, i.e., the effect of the tax shield, which reduces the tax burden on the company through interest on foreign capital, which is an accounting and tax-recognized cost. In case of macroeconomic conditions, despite the substantial development of capital structure literature, only little attention has been paid to the effects of macroeconomic conditions on credit risk and capital structure choices (Metel'skaya 2021). Based on research by (Balios et al. 2016) macroeconomic conditions do affect firms' financing choices and firms adjust their leverage toward target faster in good macroeconomic states relative to bad states. Li and Stathis (2017) also indicated that liquidity, profitability, assets structure, and asset size are significant factors which impacts firms' financial leverage. The general result from the various capital structure studies is that the combination of financial leverage related costs and the tax advantage of debt produces an optimal capital structure below 100% debt financing (Nguyen, Nguyen 2020). Furthermore, Rokhayati,

Pramuka and Sudarto (2019) state that the optimal capital structure is achieved when there is a balance between the benefits of using debt with the cost of using debt as a proxy for financial leverage. By making financial decisions require to respect balance rules. One of them the Golden rule of financing. Besides this rule also should be followed the Current Ratio Rule and One to One Rule which are used to assess assets and capital structure (Konečný 2013). One of possible approach how to investigate the relationship between leverage and firm performance on firms' financial leverage is to evaluate the ratios of financial leverage effect. If the ratio's value  $> 1$  meaning that  $ROE/ROA > 1$ , then positive financial leverage effects occur; in other words, the increase of debt will lead to the improvement of equity's profitability. If the ratio's value  $< 1$  meaning that  $ROE/ROA < 1$ , then negative financial leverage effects occur (MacCarthy, Ahlu 2019).

## Methodology

This research estimated the efficiency of 8 forest enterprises in Slovakia by an application of basic rules of financing and their effect on firms' financial leverage. These companies are differed from each other in the form of ownership, organizational structure, size of the company, as well as the size of the managed space. Furthermore, the level of reporting and accounting of companies as well as their access to information is also different. Eight particular companies were selected on basis of the managed forestry space and the size of revenues. In our research the selected period for the research was for the 5 years from 2015–2019 due to the availability of economic and financial data. According to the focus of this article the primary sources of information about the financial and economic situation were the financial statements of the selected companies as well as the information contained in the annual reports, published on the internet ([www.finstat.sk](http://www.finstat.sk)). It is based on the requirement for comparability of the business activities through the years and the last available published accounting reports. Some of the basic activities of the above mentioned enterprises included timber harvesting, cultivation activities, afforestation and other specific services. One of possible approach how to investigate the relationship between leverage and firm performance on firms' financial leverage is to evaluate the ratios of financial leverage effect. Enterprises performance is represented by accounting performance measures, the return on assets - ROA ( $EBIT/\text{total assets}$ ), and ROE is the return on equity ( $EAT/\text{equity}$ ). Method of calculation for leverage effect is represented by formula  $ROE/ROA$ .

## Results and discussion

First part of the paper compares the assets and capital structure in selected forest enterprises for the period from 2015 to 2019. In case of recommended values, the assets side, the ratio between long-term and short-term assets is 50 to 50. On the liabilities side, the recommended values are 40% equity, 40% long-term liabilities and 20% short-term liabilities.

**Table 1. Asset and capital structure in selected forest enterprises**

Ø	Asset and capital structure [%]				
	Equity	Long term liabilities	Short term liabilities	Long term assets	Short term assets
Forests Slovakia	85%	9%	6%	90%	10%
Military Forests	77%	16%	7%	96%	4%
Town Forests Kremnica	80%	12%	8%	59%	41%
Town Forests Kosice	72%	16%	13%	67%	33%
Forest Community PL	65%	20%	15%	32%	68%
Forest Community Stiavnik	28%	5%	67%	71%	29%
LES-WOOD	42%	22%	36%	49%	51%
DI MIHALIK	56%	5%	39%	57%	43%

Source: Our own work

The average values of assets and capital structure in selected forest enterprises is shown in *Table 1*. Not only there are differences between the individual enterprises assets and capital structure as well as derogations from the recommended values. While the assets side, the recommended values are most closely approached by the private companies Town Forests Kremnica, LES-WOOD and DI-MIHALIK. A significant share of long-term assets 90% in the Forests Slovakia and Military Forests, where the share reaches 96%. In addition, the only forest enterprise that had a significant share of short-term assets nearly 68% was Forest Community PL. Likewise the capital structure reflects derogations. A significantly higher share of equity is in the Forests Slovakia 85%, Military Forests almost 77%, Town Forests Kremnica 80% and Town Forests Kosice nearly 72%. On the contrary Forest Community Stiavnik, as the only one, reached the amount of equity below the recommended value less than 28%. Table 1 also shows low share of long-term liabilities in all of the selected enterprises.

**Table 2. Basic rules of financing in selected forest enterprises**

Ø	Basic rules of financing		
	Golden rule of financing [%]	Current Ratio Rule [coeff.]	One to One Rule [%]
Forests Slovakia	105%	1.71	17%
Military Forests	97%	0.56	30%
Town Forests Kremnica	157%	5.28	25%
Town Forests Kosice	131%	2.62	39%
Forest Community PL	269%	4.54	56%
Forest Community Stiavnik	47%	0.43	265%
LES-WOOD	135%	1.62	151%
DI MIHALIK	108%	1.10	82%

Source: Our own work

In the context of application of basic financing rules *Table 2* shows that almost all forest enterprises were overcapitalised during the selected period, that means they have no problems paying short-term liabilities as Golden rule explain. On the other side, it shows that Forest Community Stiavnik has significant liquidity problems, that means it is significantly undercapitalized. The findings of the Current ratio rules that is comply with principle when the coefficient is greater than 1.0, thus the value of the Golden rule critical situation in Forest Community Stiavnik and Military Forests, which results into difficulties with maturity of short-term liabilities. However, the One to One rule recommend the volume of liabilities should not exceeded 70%, Forest Community Stiavnik and LES-WOOD achieved significant high values which reported to a large proportion of foreign resources.

**Table 3. Ratios and Financial leverage in selected forest enterprises**

Ø	Financial leverage effects		
	ROE [%]	ROA [%]	Financial leverage [coeff.]
Forests Slovakia	0.85%	0.88%	0.95
Military Forests	0.26%	0.31%	0.88
Town Forests Kremnica	7.89%	8.02%	0.98
Town Forests Kosice	6.75%	6.15%	1.12

Forest Community PL	7.79%	5.70%	1.33
Forest Community Stiavnik	-0.04%	0.17%	-0.53
LES-WOOD	31.75%	16.92%	1.76
DI MIHALIK	19.25%	16.37%	1.20

Source: Our own work

From the above *Table 3* the results show the average values of analysed ratios and financial leverage. Referring to assets structure, companies owning a large proportion of fixed assets register lower ROE ratio. Therefore, it can be assumed that the more debt firms employ the less profitable they are. Due to specifics of forestry, enterprises do not use their assets effectively. Which means managerial decisions, about the capital structure tends to be affected by the characteristics of forestry. Furthermore, based on the result the ROE, the best achieved profitability was in private enterprises LES-WOOD and DI MIHALIK. Simultaneous these two mentioned enterprises were able to capitalised the best way. The ratio between ROE and ROA reached the highest value in LES-WOOD, which is proof by the financial leverage. Consistent with financial leverage ratio's if value is above 1.0 is indicates the potential of enterprises to use positive financial leverage effects.

These results explain that forest enterprises with high levels of asset structure tend to use low levels of debt, and this implies that companies that have a lot of assets, especially current assets, will tend to reduce the use of debt. The results of this paper are in line with previous research which explains that asset structure has a negative and significant influence on leverage (Newman, Gunessee, Hilton 2010). Furthermore, enterprises with high levels of ability to meet short-term liabilities will tend to use more debt to meet their capital needs (Raude et al. 2015). It can be assumed that equity has a positive impact on performance indicators, while total debt and short-term debt have negative relationships with ROA and ROE. The findings of Vízslai (2015), who analysed state-owned forest enterprises in Slovakia researched to analogous conclusions, that forest enterprises use external sources for financing in a very low proportion. Research of Neykov et al. (2021) also emphasized that the Slovak forest enterprises rely on their own resources, which is the reason for the lower efficiency of labour and material costs. As foreign authors pointed out (Badini, Hajjar, Kozak 2018), small and medium-sized forestry enterprises are considered by banks to be risky, due to seasonality (Humphries et al. 2012), due to insufficient financial history or lack of appropriate liabilities (Tomaselli, Timko, Kozak 2013).

## Conclusion

Results of the paper point out on differences between forest enterprises. The assets and capital structure is not optimal. The analysis of the assets and capital structure according to the rules of financing find out some issues connected mostly with the lack of foreign investments and foreign capital. The results of the present paper pointed out the fact that forest enterprises losing the opportunity for development and economic growth. On the historical ground forest enterprises were financed their business activities mainly by own equity. Furthermore, production efficiency and competitive advantage in forest enterprises can be achieved by implementation of modern technologies. The outcome of this effect can generate energy savings, repair work and renovation saving, as well as the effect of the tax shield. It is also necessary to mention the positive impact on the environment and other ecological factors. In addition, there is another opportunity in assets structure, where the dominant position is represented by long-term assets. Therefore, the analysed forest enterprises should increase a share of the short-term assets in order to keep it in optimal balance. Likewise, in view of the need to identify a non-commercial activities by forests enterprises and to ensure the participation of government grants. Securing sufficient capital for a company's operations in such a rapidly changing environment is complicated and problematic for many enterprises. However, given the uncertain economic and political environment, micro and small enterprises tend not to be exposed to excessive risk in the event of insufficient corporate liquidity. As a result of the providing analysis, it is necessary, in order to enable the assets and capital restructuring in the forest enterprises. This research has limitations that should be considered. This paper does not consider other factors that may affect leverage and performance such as corporate governance and market competition. For a better understanding of how capital structure and financing decisions influence the financial performance of forest enterprises, future research should refer to various performance indicators.

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## IS GREEN A SUPER DEAL? GREEN ENERGY AND ITS REAL COST AND BENEFIT FOR CUSTOMERS

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**Abstract:** Nowadays, the phenomenon of sustainability in a form of green energy is one of the most discussed topics in public as well as in government, especially in the European Union. A change of lifestyle, new trends in the industry, expanding e-mobility; all these factors increase the demand of electricity. On the other side of the equation is supply, which is highly influenced by the government decisions. New trend in Europe is to decrease amount of coal and nuclear power plants which are considered to be non-ecological, together with stimulation of growth in matter of renewable resources. The paper analyses one of the stimulation tools – the market of Renewable Energy Guarantees of Origin. The purpose of this analysis is to compare real impact of the guarantees with their marketing impact. Electricity is a specific commodity which cannot be stored, and its origin cannot be identified. Because of these specifics the market of Renewable Energy Guarantees of Origin exists along with the energy market. The number of guarantees depends on the total amount of MWh produced without further identification of the units sold. The initial price is given by the regulator of the market and the final price is given by the market. It must be noted, that in Europe there is one market with regional submarkets whose quality is guaranteed by the Association of Issuing Bodies IVZW (AIB) registered in Brussels, Belgium, and so international trade is possible.

**Purpose:** The paper analyses the framework given by law and regulators, the mechanics of both energy market and energy guarantees market. The outcome is compared with the marketing strategy of sales companies. The purpose of this analysis is to compare real impact of the guarantees with their marketing impact.

**Methodology:** Empirical analysis of the markets and their structures, questionnaire.

**Findings:** Conclusion following the analysis is that the trade model of Renewable Energy Guarantees of Origin has negligible impact as growth stimulator of the industry. The guarantees are more likely to be only a marketing tool which could be considered a part of the greenwashing trend – so called green solution without real impact on the environmental aspects

**Key words:** energy market, green energy, marketing, Renewable Energy Guarantees of Origin, renewables

### Introduction

Together with the renewables the green energy is 21st century's phenomenon and one of the most discussed topics within sustainability. On one side we have supporters of new solutions, on the other side there is discussion whether the renewables will sufficiently cover consumption without causing fluctuations in network and if they are really green, considering the material used for their production, such as photovoltaics. Who is right? It is hard to tell because the answer is in the middle and this topic is not black or white.

The paper analyses one part of the puzzle – the green electricity and the market of Renewable Energy Guarantees of origin. The purpose of this analysis is to

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compare the real impact of the guarantees with their marketing impact. The aim is to answer the question whether green energy as a product is only a marketing tool or if it has a real added value on the amount of green electricity produced.

### **Literature review / Research Background**

Electricity and its transmission to sustainability is described in many papers as emission decreasing is a huge part of environmental goals. Mostly there are discussion about the importance of supply chains for a low carbon, sustainable, and secure future with a focus on the links between water intensity, land use, GHG emissions, and materials supply, and energy generation (Arent, 2014). On the other hand, there is criticism of improper costs, mistakes in processes and possible space for corruption as there is a pressure from interest groups (Morriss, 2011).

Also, the mechanisms of the trading and pricing is very important as liberalization of the markets is on different level in each country and the regulation policy can vary (McGowan, 1990).

One aspect of the renewables is the technical point of view and the framework of the market, but as long as it is area with impact on everyone, there is a need to examine end customers' perception and preferences, too. In this concern, there are also research available, with focus on behavioural economics and willingness to pay. One of them is the research done in Greece, in which different perception from individual's point of view and the interest of the community is examined (Kontogianni, Tourkolias, Skourtos, 2013). Another aspect is willingness to pay extra for green solutions (Goett, Hudson, Train, 2000).

The background of the research is based on papers focused on both – framework and behaviour of the customers using empirical methods, with consideration of legal framework of the market in Czech Republic. For preparation of the questionnaire about willingness to pay the previous research of customer behaviour were used.

### **Methodology**

The paper analyses the framework given by law and regulators in Czech Republic and the mechanics of both energy market and energy guarantees market. The outcome is compared with the marketing strategy of the sales companies. For the purpose of the analysis so called biggest players on the Czech market, which are also obligatory buyers of green electricity, determined by §Law no. 165/2012 Sb. were chosen. These chosen companies are ČEZ Prodej, a.s., E.ON Energie, a.s. and Pražská energetika, a.s.

Moreover, to examine the impact of the certificates the customer research was done. The research was done by online questionnaire with simple questions about knowledge of green electricity and willingness to pay for it.

## Results and discussion

There are several circumstances why market of the renewables is developing as it is – increasing of production but at the same time decreasing of total share. The examination of all independent variables is not object of the paper and we focused only on the certificates.

Analysis showed that certificates have negligible impact as growth stimulator of the industry, because of the transaction cost, which causes dead weight loss and because of the fact, that demand and supply equilibrium is lower than production, based on energy mix of the chosen companies from table 1 and results of the customer research, where less than 5 % from total amount of respondents would be interested in green electricity if price would be higher

*. Table 1. National energy mix in 2019*

	2013	2014	2015	2016	2017	2018	2019
Renewables	5,68	10,95	11,7	10,11	7,6	6,17	3,9
<i>Sun</i>	1,96	2,63	2,88	2,77	2,14	2,07	1,66
<i>Wind</i>	0,47	0,57	0,71	0,63	0,45	0,22	0,00
<i>Water</i>	1,93	2,56	2,67	1,15	1,43	0,77	0,44
<i>Geothermal</i>	0,00	0,00	0,00	0,00	0,00	0,00	0,00
<i>Biomass</i>	1,33	2,19	2,34	5,57	3,58	3,11	1,81
<i>Others</i>	0,00	2,99	3,17	0,00	0,00	0,00	0,00
Fossil	57,65	52,77	55,10	59,53	57,40	56,95	57,01
Nuclear	36,67	36,28	33,13	30,36	35,01	36,88	39,09

Source: OTE

### **Energy market and market of renewable energy guarantees of origin**

The specific parameter of energy trade is, that it is impossible to store commodity. There are three options how the electricity can be traded:

- Over the Counter
- Broker platform
- Exchange
  - o Power Exchange Central Europe (PXE)
  - o European Energy Exchange (EEX)

The reason to set up the market of Renewable Energy Guarantees of Origin was that the identification of specific kind of electricity traded is technically impossible . These so called ‘certificates’ are separately traded between supplier and manufacturer or supplier and supplier because the certificates are transferable and tradable within European Union.

The quality of the certificates and trade rules are guaranteed by the Association of Issuing Bodies IVZW (AIB) registered in Brussels, Belgium. Trade with guarantees started in 2013. Initial price is given by regulator of the market. Regional guarantees in Czech Republic are issued by OTE, a.s., which is state institution set

up by law and it is responsible for operating of the market. The price for issuing a guarantee of origin is 1,25 CZK/MWh, transaction fee 0,25 CZK /MWh and the price for maintaining an account in the register of guarantees of origin is 100 CZK/monthly.

On one hand there are transaction costs, but on the other hand there are subsidies from the same institute in the form of given price. Given by §Law no. 165/2012 Sb. OTE pays to obligatory buyer the difference between purchase price and hourly price and the price for its activities. The final price is given by regulator and it is a form of direct subsidy.

**Table 2. The price for the activity of the obligatory buyer**

	Price CZK/MWh
ČEZ Prodej, a.s.	203,53
E.ON Energie, a.s.	192,19
Pražská energetika, a.s	832,60

Source: OTE

### **Analysis of suppliers**

All three main suppliers run campaign about green electricity. The average price for ‘green’ tariffs was around 30 CZK/MWh extra, for example ČEZ offered regular tariff STANDARD for 1699 CZK/MWh without VAT and STANDARD included green electricity for 1729 CZK/MWh without VAT

. On the first sight we can see on the website marketing message why customer should consider green electricity. The reason is mostly supporting renewables, increasing demand for renewables which aims to decreasing of CO<sub>2</sub>. If we would go deeper and check the website in bigger detail, we would notice an explanations how green electricity works. In case of ČEZ, the company explained the extra price –it is a special fee for issuing the certificate, so there is no further money transfer to manufacturer. They claim, that thanks to higher demand, there is a higher supply of green electricity in the network. As we mentioned before, the energy cannot be stored and market is almost non elastic, because of high primary investments and legal framework. Therefore, it is impossible to increase supply in short time, especially if certificates do not increase income of the manufacturer. The fee for certificates only causes dead weight loss because the extra money which customer pays is transferred to operator and not to power plants.

Another company, E.ON, which is the biggest purchaser of green energy in Czech Republic, explains, that there are limited renewable resources in Czech republic and that is why in the case of too high demand they would buy certificates abroad – once again, the powerplants cannot react on higher demand because of the barriers of the market. This fact eliminates the added value that customers are improving their living standards, because they are not – not in centralized network.

The certificates are tradable within the whole European union, which decrease the effect of improving living standards – however analysed big players claim to buy green energy only from Czech companies, smaller suppliers do not guarantee this

. Despite the fact the advertisement of the product of green electricity started, the total amount of the renewables purchased in energy mix did not increase – the reason is limited demand of the customers based on customer research which is lower than offer of the suppliers presented in table 3.

**Table 3. Suppliers' energy mix in 2019**

	ČEZ	E.ON	PRE
Renewables	4,43%	22,93%	4,26%
Fossil	53,50%	49,63%	56,91%
Nuclear	42,06%	27,44%	38,83%

Source: ČEZ, E.ON, PRE

## Conclusion

Conclusion following the analysis is that the trade model of Renewable Energy Guarantees of Origin has negligible impact as growth stimulator of the industry. The guarantees are more likely to be only a marketing tool which could be considered a part of the greenwashing trend – so called green solution without real impact on the environmental aspects. The real cost for the customer is death weight loss caused by transaction costs which increase final commodity price. On the other hand, the benefit is low, because of the central network and tradable certificates, where is no guarantee that customer would decrease the emission within own living area.

There are known other tools which can support renewables directly without causing dead weight loss, but they are not object of the paper.

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# MOBILE APPS AS AN IMPORTANT MARKETING COMMUNICATION TOOL IN STARTUP BUSINESS IN THE SLOVAK REPUBLIC

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**Abstract:** The aim of this conference paper is to provide a perspective on the issues in start-up entrepreneurship. Start-ups in the European Union represent a driving force for research and development in many areas, and therefore the authors have sought to obtain insightful information on the entrepreneurship of entities that consider themselves start-ups from the beginning of their business activities. Start-up business models are significantly supported by EU funds and in Slovakia by the Slovak Business Agency. Many of these ideas have become successful products and profitable business forms.

The main methods of research on start-up businesses were qualitative and quantitative marketing research methods. A questionnaire survey was sent to a selected sample of small and medium-sized enterprises in Slovakia based on data from the Statistical Office of the Slovak Republic. The return rate of the questionnaire was 638. Enterprises answered questions related to the focus of business activity, the area of start-up entrepreneurship, the innovativeness of enterprises, and the merit questions addressed mobile applications, patents, and trademarks of the surveyed enterprises. The data collected by the questionnaire survey was processed by advanced statistical methods, the method of artificial neural networks (ANN) was used to identify influential variables. Critical analysis is being used to identify specific factors and reasons that influenced the start-up enterprises' decisions to develop mobile applications and their subsequent use in marketing communications.

The paper brings empirical evidence of how locally based companies have been approaching the evaluation of mobile apps and how they incorporate the specific modern forms of marketing communications into their start-up development. The research yielded interesting findings that more than 36% of the companies studied started as start-ups and more than 24% of the entities still consider their activities as start-up activities. 17% of the surveyed enterprises have already developed a mobile app for both Android and IOS and more than 20 plan to develop mobile apps, more than 8% have mobile apps in the development phase.

The findings published in the paper are partial results of the INMARK research task, in which the researchers are looking for innovative approaches to marketing management, not only in the field of marketing communication but across all marketing tools. The creation of mobile applications as new products is analysed in terms of the reasons that preceded its creation. Designing a model of innovative approaches in marketing management can help a number of start-ups in their managerial decision-making and marketing management.

**Key words:** start-up, mobile app, marketing, new product development, innovative marketing tools

## Introduction

Our world is currently affected by a health crisis caused by the coronavirus pandemic (COVID-19). We have to cope with various restrictive measures (e.g. regional lockdowns, business restrictions, social distancing). These measures are

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undoubtedly curbing the spread of the pandemic, but unfortunately, they are also not contributing to the development of the business activities of the majority of enterprises, not only in Slovakia but worldwide. In March 2020, the International Monetary Fund declared that the global economy has entered a recession and the outcome may be worse than the effects of the global financial crisis in 2009 (Georgieva, 2020). Although the International Monetary Fund predicts a recovery or a significant upturn, this unprecedented crisis has brought negative impacts on most companies, including innovative ones (Mora Cortez and Johnston, 2020, p. 126). In the wake of this situation, managers of firms around the world have started to intensively implement various contingency plans to overcome this pandemic crisis (Ritter and Pedersen, 2020, p. 220). Unfortunately, it is not possible to rule out further waves of pandemics and so various constraints need to be considered for the future. The possibilities of digital technologies help to overcome some of the complications.

In the new global economy, innovative start-ups have been seen as a key player in economic development. The reasons for their importance are their contributions to job creation (which increases employment) and economic growth at regional, national, and industrial levels. Their contribution can be seen in the generation of breakthrough innovations and future large enterprises (Tripathi et al., 2019, p.58).

The aim of the paper is a perspective on the issues in start-up entrepreneurship. Start-up business models are significantly supported by EU funds and in Slovakia by the Slovak Business Agency. Many of these ideas have become successful products and profitable business forms. Start-ups have earned an irreplaceable place in today's national economy. Many success stories and case studies from beyond Slovakia's borders show that this type of entrepreneurship has the potential to increase foreign investment inflows, strengthen the innovation capacity of the economy, and at the same time can significantly strengthen competitiveness and create new jobs in special sectors with high added value.

Authors consider that the most important thing is to get entrepreneurial business environment, and the regulatory framework in the field of innovation support and entrepreneurship education. All these aspects are basic prerequisites for the further development of this type of business, that is, a segment of mostly micro-enterprises. The authors decided to look for and specify the reasons that led start-up units to create their own mobile applications and their use in modern forms of marketing communication.

## **Literature review**

The experience of many foreign and domestic companies indicates a significant impact of digitalization on sales activities. Digital methods of processing and using information are a major source of efficiency and effectiveness of these activities (Rourke, 2018, p. 133). The challenges of modern globalization contribute to the rapid implementation of the latest innovative capabilities of the digital world. It is also due to the ongoing digitalization that the field of marketing communication is evolving rapidly. (Verhoef et al., 2021, p. 889). In this context, modern digital

marketing communication has established itself as an ever-growing part of marketing firms (Schubach and Schumann, 2020, p. 469, Santosh and Patil, 2020, p.13). In addition, the use of multi-channel marketing activities is important to stay competitive (Li et al., 2017, p.42) as well as the ability of digital agility in marketing communication (Verhoef et al., 2021, p. 890).

There is a clearly entrenched view of traditional marketing and its potential to use communication tools. With digital tools becoming more prevalent in IMC, consumers can actually experience an increased level of convenience and undeniable speed that brings knowledge, and thus we can make consumers realize the value of communicated goods much faster (Colton, 2018, p. 94).

The Covid-19 pandemic has changed consumer behaviour in every way. This has probably been most reflected in online shopping, with a significant proportion of purchases moving online. The e-commerce sector continues to expect very positive prospects for significant growth. According to research by eMarketer, global spending on online shopping is expected to grow from €3.2 trillion in 2019 to €5.9 trillion in 2023. m-commerce, which is considered one of the fastest growing industries, is gaining a stronger foothold in e-commerce. It is inextricably linked to the growth in consumer purchases using mobile apps. Mobile apps are end-user software applications developed for the smartphone operating system and are able to extend the capabilities of the device by allowing individuals and app providers to complete additional tasks beyond those available on the brand's website (Purcell, Entner, & Henderson, 2010). Often cited as a unique advantage of mobile apps is the ability to be accessed anytime, anywhere, providing consumers with a useful and easy way to shop (Marriott & Williams, 2018, p. 134).

Even with the Covid-19 pandemic currently underway, where the shift in consumer behaviour towards the online space is evident, it appears that mobile shopping has the potential to become a mainstream shopping channel and change consumer habits even more fundamentally. This is due to the fact that consumers are now more dependent on digital devices than ever before. From a marketing perspective, it should be noted that the growth of smartphone devices and the subsequent adoption of mobile apps is changing not only the recalled attitude towards shopping, but also how consumers interact with brands (Fang, 2019, p.337).

## **Methodology**

The main methods of research on start-up businesses were qualitative and quantitative marketing research methods. The questionnaire survey consisted of 812 completed questionnaires. Questions in the survey were related to the focus of business activity, the area of start-up entrepreneurship, the innovativeness of enterprises, The merit questions were addressed to the area of mobile applications, patents, and trademarks (together 17 questions). 10 questions were oriented to the characteristics of surveyed enterprises, region, date of establishment, and identification questions about the respondents, relationship to the enterprise, gender, education, etc. The method of artificial neural networks (ANN) was used to identify influential variables (Fajčíková, 2017, p. 1514). Critical analysis is being used to

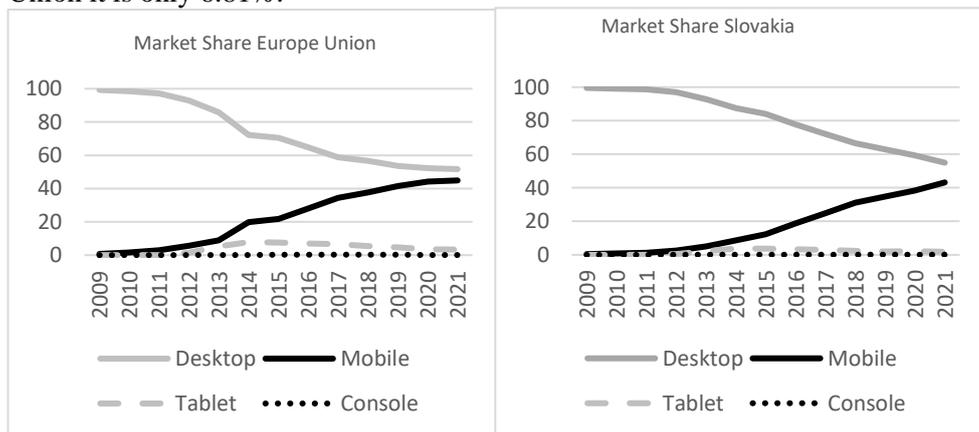
identify specific factors and reasons. We used the SAS statistical program to process the obtained data. The non-parametric method (Stehlíková, 2005, p. 48) was the Kruskal-Wallis test. Distribution of the survey via an online form in Google forms between September 2019 and August 2020. As part of the sub-evaluations of the survey, the authors set the following hypotheses:

H1: The start-up form of business has a significant impact on the reason for creating a mobile app.(Q2-5)

H2: The main reasons for mobile app creation by start-up forms of businesses are mostly for direct communication with the customer. (Q7-10)

## Results

According to the latest data from Statcounter (Fig. 1), it is clear that although most of the Slovak population still connects from desktop devices, currently 54.95% of connections from mobile devices are growing year-on-year and will account for 43.18% of all internet accesses in 2021. Thus, from 2018 to 2021, the number of accesses from a desktop device decreased by 11.49%, and in a comparison mobile access increased by 12.15%. The situation with the change in access is even more pronounced in the case of the entire European Union, where while in Slovakia the difference between desktop and mobile access is 11.77% and within the European Union it is only 6.81%.



**Figure 1. Desktop vs Mobile vs Tablet vs Console Market share EU and Slovakia**

Sources: own processing according to statcounter

The increase in the use of mobile devices by users not only in Slovakia is forcing businesses to look for solutions to reach consumers at any hour and in any place. This is one of the main reasons why start-ups are focusing, among other things, on creating their own mobile applications. The order of importance of mobile app development does not differ much between businesses that are considered start-ups and those that are not considered start-ups. A marked difference is in the creation of a mobile app for commercial purposes. Start-ups create apps just for commercial

purposes. The most significant reason cited by both groups of businesses was "to be one step ahead of the competition" (Fig.2).



Figure 2. The reasons for developing the mobile apps

Sources: own processing according to survey

The ANN method was used to test one variable each time with five options. The baseline was the creation of a custom mobile application for businesses that were considered start-ups both currently and in the early days of entrepreneurship. As can be seen from the graph of the 10 highest sensitivities (Fig. 3), we can consider the most significant the possibility of obtaining data from customers through the created mobile application, then the creation of databases for Customer Relationships Management. Sales, being closer to customers. In the third position in sensitivity is the necessity to currently own a mobile application from the enterprise perspective. Tools of direct communication (H1 confirmation) with the customer and impersonal forms of promotion also show high sensitivities.

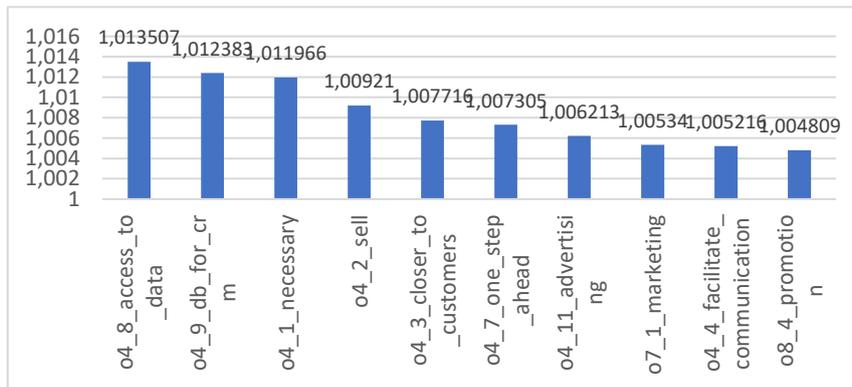
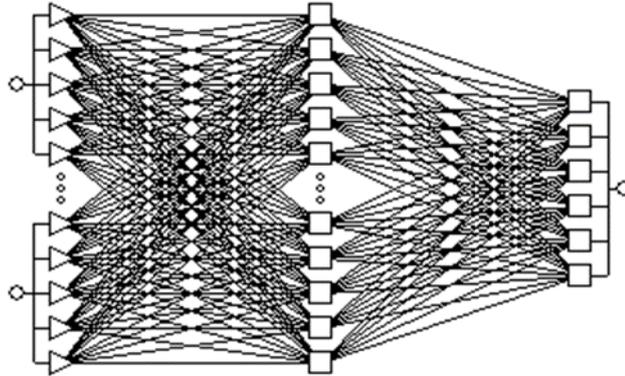


Figure 3. The highest sensitivity to the reasons for developing the mobile apps

Sources: own processing according to survey, ANN

The sixth highest sensitivity is exhibited by trying to stay one step ahead of the competition, followed immediately by advertising, which is consistent with several of the literary transformations we present in the discussion and conclusion.



**Figure 4.** ANN, MLP with 80 inputs

Sources: own processing according to survey, ANN

MLP with 80 inputs represents 1 variable with 5 alternatives, Fig.4 shows simultaneously 12 neurons in the hidden layer where 1 output has 6 alternatives.

## Discussion

Evaluation of stated hypotheses.

We reject H1. By testing the non-parametric Kruskal Wallis test and Two-sample Wilcoxon rank-sum (Mann-Whitney) test of the influence of the variable form of business start-up on the decision to create a custom mobile application. The testing failed to show that the form of business start-up has a significant impact on the creation of a mobile application as a tool for direct communication with the customer. From this point of view, the form of business is irrelevant, direct communication with potential customers through a custom mobile application was a decision made by all the enterprises of the present research. H2 we confirm. As can be seen from the ANN testing, among the 10 variables with the highest sensitivity to the creation of a custom mobile application are several IMC tools that provide a direct form of communication with the consumer. The shift to mobile is so clear and it is only a matter of time before there are more mobile accesses. Mobile apps were initially offered for general utilitarian purposes such as emails, calendars, and weather information (Hsiao et al., 2016, p.343); social networking (Salehan end Negahban, 2013, p.2635), and mobile shopping capabilities (Lu et al., 2017, p.5). Unlike websites, a mobile app can offer a more customized environment and leverages both software and hardware features of the mobile device to provide a unique experience to the consumers i.e., using the camera function to scan barcodes, using GPS features to provide location-specific content, and keeping customers up to date with push notifications.

## Conclusion

The significance of this claim is illustrated by the fact that in 2021, the European Union has created the so-called Digital Compass 2030 (Europe's concept of the Digital Decade), which commits to doubling the number of innovative and emerging 'unicorns' by 2030 (Europe union, 2021). Start-up unicorns are pre-IPO businesses valued at more than USD 1 billion. Just a few years ago, there were only a handful of these companies in the world, and that is why they are referred to as unicorns (Aldrich, & Ruef, 2018, p.20).

The creation of mobile applications as new products has been analysed in terms of the reasons that preceded its creation. From the partial results of the INMARK research task, it is possible to confirm the importance of creating your own mobile application not only for start-up forms of business, but also for other businesses that want to communicate with customers using modern communication tools, so as not to lose the overview and use the mobile application to create customer databases and improve CRM.

Designing a model of innovative approaches in marketing management can help a number of start-ups in their managerial decision-making and marketing management. Start-up entrepreneurship, as in the entire SME segment, can only move forward if it is supported by an appropriate business environment. Barriers to starting a business should be removed as far as possible and regulatory and administrative burdens systematically removed.

As an untapped potential for business development of young talents, start-up and innovation potential of the country's economy, we also see insufficient activities and efforts to continuously and systematically link academic research with real needs of the private sector. In line with the findings as well as demonstrable statistical analyses, we can conclude that in start-up and innovative businesses, enterprise mobile apps play a very important role in the modern marketing communication.

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# SHAPING AND MANAGING SELF-IMAGE AND MODULAR IDENTITY 2.0 – THE CASE STUDY OF POLISH LANGUAGE WIKIPEDIA USERSPACE

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**Abstract:** The user pages of Wikipedia enable self-presentation and are used to build a personal brand. Managing self-image is possible, among others, by small banners called userboxes. Initially, they were supposed to be objective information about someone, not an element of self-presentation of one's personality. However, different types of userboxes were introduced.

**Purpose:** The aim of the research is to analyze the use of the userboxes in the context of managing one's self-image and discussing the idea of modular identity 2.0.

**Methodology:** In the presented research, an attempt was made to characterize the course of the variability of userboxes as cultural elements that allow to shape and manage the image and determine the identity of the individuals posting them. For this purpose, qualitative and quantitative analysis of the content of the userboxes placed on the userpages was conducted, focusing primarily on the frequency of their occurrence and their modification over time.

**Findings:** The analysis of the content of over a thousand userboxes shows that after a short period of high variability at the beginning, the growth of new banners became smaller. As the results indicate, the most frequently replicated userboxes in Polish-language Wikipedia are those related to Wikipedia's digital environment, community identity and health. Moreover, the construction of self-image is becoming more and more reproductive, schematic and based on imitation.

**Research limitations:** Research has been conducted on one language version of Wikipedia. Some further comparisons with other language versions are recommended.

**Key words:** digital marketing, image management, personal brand, userboxes, Wikipedia  
**Jel code:** Z13

## Introduction

In the digitalization era people more and more often build their self-image both in the real world and in the virtual space. They use various techniques connected with promotion which enable them to differentiate from other people. Personal branding is a new marketing concept related to the marketing strategies that people adopt in order to promote themselves in the market. People and their careers begin to be marked and perceived as brands. Personal branding is intended to create an asset as well as brand equity that refers to a particular person or individual. (Karaduman 2013).

Branding usually involves significant financial resources to create brand awareness and then subsequently brand loyalty. Social media enable people to promote themselves as brands in an efficient and usually cheap manner. The world

<https://doi.org/10.11118/978-80-7509-820-7-0318>



of business is beginning to acknowledge the importance of controlling personal brands and offer some advice on how to develop a personal brand identity through the use of different social media (Labrecque, Markos, Milne 2011).

In Wikipedia, the advertising ban is connected with one of its pillars, namely „the neutral point of view”. Apart from the encyclopedia's entry pages and special spaces constituting its technical backstage, userpages are an important part of the Wikipedia. To a limited extent, they are free from the prohibition of pushing through one's point of view, and thus also of presenting one's own system of values. This, in turn, is a gateway for promotional activities. One of ways of presenting self-image are banners called userboxes, which are the subject of this research.

The above remarks lead to considering the self-presentation of wikipedians and promoting their values in an environment which is critical to the promotional activity. In the text, the authors take up this thread in the context of the modularity of the content and the processes of imitation. The main aim of the research is to analyze the use of the userboxes in the context of managing one's own image and discussing the idea of modular identity 2.0, as one of the most important and interesting new trends in personal branding online.

### **Literature review**

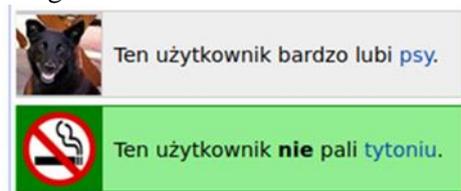
The userpages of Wikipedia enable self-presentation and are used to build a personal brand. D.L. Lair, K. Sullivan and G. Cheney (2005) describe personal branding as involving „concepts of product development and promotion (...) used to market persons for entry into or transition within the labor market”. I. Shepherd (2005) in turn defined personal branding as a varied activities undertaken by individuals to make themselves known in the marketplace.

The first phase of personal branding is to establish own brand identity. People have to differentiate from the competition while fitting expectations of a specific target group. The second phase is to develop the brand's positioning by developing communication of one's brand identity through managing behavior, communication and use of symbols. The last phase is to evaluate a brand's image in order to fulfill personal and professional objectives (Khedher 2014, Khedher 2019).

Digital media facilitate innovation in self-presentation, but also generation of false identities. Creating fake accounts in social media is often used (sometimes permanently) in marketing activities. Creating own image on internet websites is therefore often treated suspiciously by other users in terms of authenticity of a given identity. Most digital media, both in the dotcom era and in the web 2.0 era, are driven by advertising revenues and in this respect are no different from the traditional media. Users are attacked by marketing messages, but they are also involved in promoting products and services (Shafieea et al. 2020).

Wikipedians often use their user pages to present themselves, their values, skills, and project activities. The design of the user's website and content, as long as they

do not exceed the acceptable standards, can be shaped freely. A significant number of wikipedians' userpages are based on template patterns that have spontaneously developed in the project. Managing one's self-image is possible, among others, by the userboxes. They are small banners which the users put on their user pages (user profiles) (fig. 1). They are banners about hobbies, interests, place of residence, popular culture, sexual orientation and political affiliation. Creating a userpage does not require using them, but a significant number of people do it, expressing their own characteristics. Often for this purpose, the userboxes are „borrowed” from other users. In this way, the range of the most attractive ones is increased.



**Figure 1. Examples of userboxes**

Source: pl.wikipedia.org; the first picture by Pleple2000, CC-BY-SA-3.0

Modularity seen in webpage creation can be described in the context of psychoevolutionary and memetic theories. The diversity of the identities of the individuals results from the multiplicity of modules at the disposal of their minds (Buss 2003, pp. 70-78). J. Neckar points out, however, that the modular nature of mind is not necessarily what evolutionary psychologists portray. „Modularity in terms of cognitive, motivational and emotional functions, perhaps, should be interpreted more as sensitivity to a certain type of environmental impact and readiness for a certain direction of development, and not as a largely complete structure” (Neckar 2018, p. 185). In memetics, modularity refers to the cultural evolution. It occurs by replicating and mutating its tiniest elements, the memes, in peoples' minds. Contrary to evolutionary built-in modules, memes are acquired in the process of socialization, yet the effectiveness of their replication depends also on their adaptation to the mental environment of an individual (Łaszczyca 2017). The analyzes of the processes of co-creating cultural content in the cyberspace raise the issue of the importance of modularity in the context of possibility of changing (mixing) and copying (replicating) previously shared works. Wikipedia is cited there as a major project which value is increasing due to small improvements made by thousands of internet users.

The first userboxes were created to present one's knowledge of languages. Hence, it was supposed to be objective information about someone, not an element of self-presentation of one's own personality. However, other types of userboxes were introduced very quickly. In the English version of Wikipedia, these were banners about hobbies, interests, place of residence, popular culture, sexual orientation and political affiliation (Westerman 2009).

Promoting certain values, attitudes and world views through the wikipedian's userpages is usually not a strictly marketing activity, but it is building self-image and managing it by manipulating the components of the website. The higher the social status of a wikipedian (resulting from his activity and obtained rights), the greater the content he presents can be accepted by the community. At the same time, along with creating their own identity as a wikipedian, the users try to promote the values of the project to a greater extent (see: Neff et al. 2013). The presentation of non-neutral values (political, religious) is also tolerated to a greater extent, if they are common among the members of a given language version of Wikipedia.

The wikipedian's userpage, as not being part of the encyclopedia, allows for more free posting of content and also a more liberal approach to the issue of credibility. Hence, committed wikipedians often create controversial userboxes. In some language versions it has even become necessary to establish general rules for creating this type of banners (Westerman 2009). Credibility and neutrality are among Wikipedia's guiding principles for creating Wikipedia content.

Research on discussions on the deletion of individual articles in the English version of Wikipedia indicates that the course of these discussions is especially lively when they are joined by people who post a lot of information about themselves on their own userpages (Joyce and Pike 2017). Research on the political identity of wikipedians implies that the issue of identity change is connected with the transition from engaging in editing articles significant for the individual to acting for Wikipedia as a whole. And thereby, peripheral units move to the center and begin to engage in the community life (Neff et al. 2013).

## **Methodology**

In the presented research, an attempt was made to characterize the course of the variability of userboxes as textual and graphic cultural elements allowing to determine the identity of the entities publishing them in the Polish-language Wikipedia. For this purpose, an analysis of the content of the pages of users posting userboxes was performed, focusing primarily on the frequency of their occurrence, their modification over time and their subject.

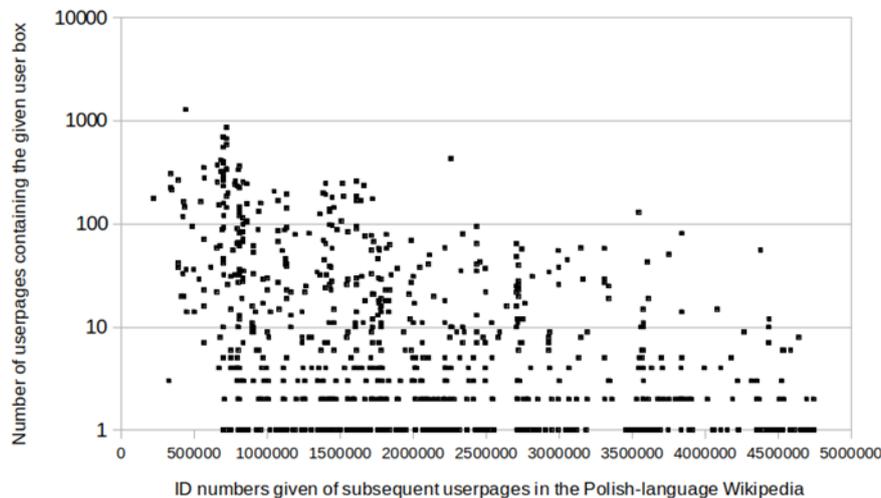
Since the userboxes with their own pages are most often categorized, the PetScan tool was used to generate a list of all the userboxes located in the category tree assigned to this type of pages. In this way, the number of 2223 userbox pages and their ID numbers were obtained, which allowed for easier determination of the increase in the diversity of userboxes over time. Each created page gets subsequent ID number. Out of this number, 1078 userboxes were selected for further analysis, which were considered susceptible to changes as they did not refer to formalized information on Wikipedia editing skills.

The further stages of the undertaken research were: determining which userboxes are the result of modification of other banners, examining the range of variability (the number of derived userboxes), the degree of dissemination on wikipedians'

userpages and their survival rate. The last element of the study was limited to checking how the number of userboxes on the userpages of the most active wikipedians' changes over time. In this sense, the survival does not mean the very existence of userbox pages, but their potential „contagiousness”. The long-term participant observation conducted by one of the authors of this text allows us to state that very often copying of userboxes takes place through imitation.

## Results and discussion

One of the most common ways to distribute userboxes is through the process of learning how users edit Wikipedia. If the user is familiar with the basic elements of the code but is technically unable to edit, he often watch the changes made by others. In the same way, wikipedians also „borrow” elements of userpages from themselves. The more often a given type of userbox is used, the greater the likelihood of multiple exposure of the mind to this visual stimulus. Usually, the wikipedians publish a whole set of userboxes in one edition on their userpage. However, authors of new variants of userboxes produce them over longer periods of time, even if it is a series of similar banners.



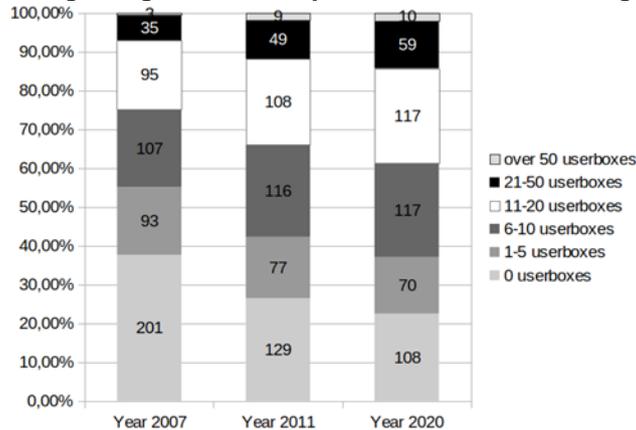
**Figure 2.** *Distribution of the appearance of subsequent userboxes over time in the Polish-language Wikipedia. N = 913*

Source: Own research

The first userboxes in the Polish-language Wikipedia appeared in 2005, and their rapid growth took place in 2006-2009. Among the analyzed userboxes susceptible to changes, more than half were produced in this period. The time of the creation of a given userbox is also important in the context of the multiplication of its copies. In the case of banners created before 2010, as many as 76 were placed on 100 or more userpages. Of the boxes created later, only 2 were placed on over 100 userpages.

Around 165 userboxes were never used on the wikipedians userpages, including 70 created by the end of 2009 (12.4%) and 95 created later (18.6%). There are 28.3 copies per userbox out of the 1078 pool. The distribution of the frequency of userboxes on wikipedians's userpages is presented in figure 2.

It was also determined how the number of userboxes changed over time among the most active wikipedians. For this purpose, the lists of the 600 most active users published at the beginning of 2007, at the end of 2011 and at the beginning of 2020 were compared. The activity concerns the number of editions made by a given account from the beginning of the activity until the time of counting.



**Figure 3. Changes in the number of userboxes on the userpages of the most active wikipedians. Generated on the basis of the lists on the Wikipedia website: Najaktywniejsi wikipedyści**

Source: Own research

The increase in the number of wikipedians userpages containing userboxes and the increase in the number of userboxes in general was much greater between 2007 and 2011 than between 2011 and 2020 (fig. 3).

In order to be able to determine the degree of variability, the content was categorized. In terms of the text used, userboxes were divided into several categories. The first category concerns the activity of a wikipedian. It includes the userboxes defining action (123), experience (84), competences (94) and being a user of certain website, software, etc. (157). The next category included userboxes defining the wikipedian's relationship to the outside world: judgments about something (18), interest in something (17), emphasizing one's belonging to a place/community, etc. (125), pointing to being a supporter of something (282) or an opponent of something (31). The third category included 134 userboxes that explicitly defined the identity of an individual („I am X”), the fourth one included 5 userboxes that were abstract jokes. In addition, 8 userboxes were personalized pieces of the interface helpful in building the „tower”. As the results indicate, the most frequently replicated userboxes in Polish-language Wikipedia are those related to Wikipedia's digital environment, community identity and health.

19 userboxes were created by modifying one of the official banners, while 49 others were derived from them. 142 userboxes were classified as original (not a modification of previous userboxes), which gave rise to another 388, including 331 in the second generation, 43 in the third, and 10, 3 and 1 respectively. For 480 userboxes, no derivative banners were identified.

In the case of derived userboxes, it was most often a simple modification, consisting in changing one or two elements, especially when they were created by the same user. Serial creation of userboxes with minimal modifications is visible especially after 2008, which indicates a decline in the formation of new niches. A parallel process is progressive standardization which makes it easier to evaluate the contribution of Wikipedians and the quality of the produced encyclopedia content.

The analysis allowed to identify the userbox elements subject to modifications. These include: text modification by rewriting, changing the link and content, changing the meaning, shortening or extending the description; modification of the graphic content or the letter code of the userbox (changing the graphics to a different one, using modified graphics, changing the case and font size in the letter code); modification of the color of the text background, graphics background (letter code) or the frame of the userbox.

In the analyzes of contemporary media, it can be noticed that long narratives are replaced by increasingly shorter statements - tweets, news tickers in television programs or visual simplifications. N. Postman assumes that in this way word-based culture is replaced with iconographic culture (Postman 2002). This is favored by the remix culture developed thanks to free licenses (Lessig 2014). This culture allows for the collective creation of encyclopedia entries, while at the same time sharing the code and modifying other people's works. This characteristics are observed also while analyzing the self-image building by the use of userboxes.

The most frequently replicated userboxes in Polish-language Wikipedia were related to Wikipedia's digital environment, community identity and health, while W. Westerman (2009) indicated that userboxes concerned mainly hobbies, interests, place of residence, popular culture, sexual orientation and political affiliation. These subjects also appear in the userboxes used by Polish Wikiedists. Frequently duplicated is also the content that is humorous and refers to emotions.

In spite of the fact that there is a high level of imitation in the use of userboxes, for many users it is not a thoughtless action. This is evidenced by the self-ironic and critical nature of using the userboxes. For example, due to the frequent use of userboxes informing about the consumption of various types of beverages, a humorous banner stating that „this user is drinking denatured alcohol” appeared.

Using the userboxes on the userpages serves to make and promote own personal brand and at the same time help to stand out from, but also to identify with the Wikipedia community. The content of the userpages detail and support the significant element of the personal brand which is a username of the wikipedians (Karaduman 2013). However, using the name of the institution or enterprises in order to advertise oneself in the Wikipedia is prohibited in Polish-language Wikipedia.

## Conclusion

The users of the Polish-language Wikipedia, similarly to other language versions, use special banners - userboxes, to introduce themselves to other members of this project. Although recognition is achieved thanks to own username, the userboxes allow you to build your „uniqueness”. With time, however, an increasing number of wikipedians use userboxes created by others, often copying sets of userboxes onto their own userpages. This may be due to the smaller technical competences of newcomers in the subsequent „generations” of wikipedians.

Research has shown a clear tendency to imitate in the use of userboxes. The most popular are those that were created in the first few years. Moreover, over time, another userboxes were created as modifications of the existing ones.

Unlike social media, Wikipedia's own pages are hardly used to build a personal brand. Even though wikipedians devote a certain amount of time to create their self-image, the level of activity in the project is still more important to their prestige. It is recommended to verify the results of this study in other language-versions of Wikipedia to extrapolate conclusions to a wider community.

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## **SECTION 4:**

### **Regional Development Management**

# DESIGNING MONITORING TOOLS: METHODOLOGICAL APPROACHES TO EVALUATION OF REGIONAL BIOECONOMY STRATEGY IMPACTS

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**Abstract:** Bioeconomy can be considered one of the fastest-growing sectors of the economy, which brings new opportunities concerning economic growth and profit maximisation and sustainability, environment protection, and appropriate use of limited resources. Monitoring bioeconomy status should be an essential task for policy-makers and other stakeholders as business entities, non-governmental organisations, and others. Bioeconomy data are often unavailable because there is an insufficient distinction between bio-based and traditional industry in national statistics, which necessitates conjugating many data sources. For these reasons, it is crucial to define methodologies, which allows comparability. Such tools can find application in evaluating environmental, economic, social progress in the field of bioeconomy by different groups of stakeholders and granting the possibility to compare differences between countries or regions to enhance policies and support mechanisms. An undeniable advantage of the correct setting of monitoring tools is the possibility of performing scenario analysis and bringing the best solutions for developing the bioeconomy sector.

**Purpose:** The paper's main aim is to compare different approaches to monitoring bioeconomy strategies and evaluate their advantages and disadvantages concerning the availability of data sources.

**Design/methodology/approach:** The paper compares attitudes and approaches of different researchers on evaluating bioeconomy status and progress supplemented by comments. We work with varying sources, including research reports and papers.

**Findings:** The paper presents selected approaches to designing monitoring tools intended to evaluate regional bioeconomy status and impacts. The authors also discuss the differences and advantages versus disadvantages of these methodologies.

**Research limitations:** The paper introduces methodological approaches into bioeconomy evaluation as the initial research stage focused on evaluating bioeconomy and eco-innovations elements usage in European Countries.

**Keywords:** bioeconomy, evaluation, methodological approaches, regions, strategy

**JEL:** Q57

## Introduction

Monitoring is the continuous and systematic generation of evidence on an intervention's activities and impacts over time. A monitoring system is a necessary and integral component of better regulation, assisting in determining whether a policy is being applied as expected on the ground, addressing any implementation issues with an intervention, and determining whether additional action is required to ensure that it can achieve its intended objectives (European Commission, 2017).

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The development of science and technology brings new opportunities that make the bioeconomy one of the fastest-growing sectors of the European economy. The interest in the bioeconomy is implied by global challenges, including ensuring food security, sustainable management of natural resources, reducing dependence on non-renewable resources, and mitigating or adapting to climate change. On the other hand, many countries emphasise the importance of the bioeconomy but do not have a comprehensive strategy for its development and implementation (Wozniak; Twardowski, 2017).

Around 50 countries have incorporated the bioeconomy into their economic and innovation plans, demonstrating intent and commitment but falling short on detail. As a result, a single system that examines the significant policy implications of a bioeconomy would be valuable (OECD, 2018) and is necessary to identify and monitor impacts and role towards other sectors (Loizou et al., 2019).

The bioeconomy can be considered a cross-sectoral living organism, and therefore it is not possible to define a single correct way of measuring it. The choice of the specific methodology and indicators examined depends primarily on the objectives that the researcher explains, whether it is only an ex-post analysis or comparison, or the creation of public policy proposals, or measures to improve the position of the bio-based sectors.

The paper summarises selected approaches of research teams, emphasising the identification of recommended indicators, their strengths and weaknesses.

## **Literature review / Research Background**

The term bioeconomy includes the production, use, and protection of biological resources, including related knowledge, science, technology, and innovation, to provide information, products, processes, and services in all sectors of the economy focused on a sustainable economy (Global Bioeconomy Summit, 2018).

Another definition is provided by BECOTEPS (2011), which states that the term bioeconomy refers to the sustainable production and conversion of biomass into various products, including food, health, industry, and energy, with biomass encompassing any biological material (originating from agriculture, forestry, fishing), which is used either as a product itself or as a raw material in future production.

The European Commission (2012) defines the bioeconomy as those parts of the economy that use renewable biological resources from land and sea - such as crops, forests, fish, animals, and microorganisms to produce food, materials, and energy.

Achieving the desired success in the bioeconomy requires the integration of public policy orientations, in particular in the following critical areas of BECOTEPS (2011):

- Investing in relevant research areas and promoting multidisciplinary.
- Promoting innovation to ensure the commercialisation of knowledge.
- Promoting entrepreneurship in the bioeconomy as a desirable career option.
- Ensure a skilled workforce for individual sectors of the bioeconomy through secondary and tertiary education.

- Simplified legislative frameworks supporting innovation.
- Appropriate forms of communication with the involved public to develop social recognition of development and innovation.

There are many definitions of the bioeconomy, but they show similarities, emphasising economic production and a broad cross-sectoral focus. The benefits and opportunities associated with the development of an advanced bioeconomy in Europe bring great optimism. On the other hand, we may encounter several risks and the need for compromises. To increase the competitiveness and sustainability of the bioeconomy, attention needs to be paid to participatory governance involving the general public and critical stakeholders in the open, informed dialogue and to the commitment of governments and industry to sustainable innovation (McCormick; Kautto, 2013).

Moreover, bioeconomy is interconnected with several other terms, including bio-based economy, green economy and circular economy, while circular economy and bioeconomy can be considered synergic concepts (Kardung et al., 2019).

Measuring the bioeconomy is still in its infancy and is fraught with methodological difficulties. Because the bioeconomy spans across industries, it cannot be classified as a specific economic sector. Economics must catch up to the reality of the bioeconomy. A thorough economic assessment necessitates knowledge of bioeconomy resources, components, and product streams. It is necessary to improve data storage and analysis approaches that might allow bioeconomy prospects to be realised and assist drive policy (Wessler, Braun et al., 2017). When official data is gathered, distinctions between bio-based and non-bio-based products are rarely made. However, production along bioeconomy supply chains and the implications for sustainability necessitate monitoring and assessment to enable informed policymaking (Jander et al., 2020).

The bioeconomy, as an industrial metabolism based on renewable resources, is distinguished by potential benefits for global sustainability, which are dependent on a variety of conditions and players. As a result, proper systematic monitoring of its progress is critical and intricately tied to the Sustainable Development Goals (SDGs) and various stakeholder expectations (Zeug et al., 2019). The EU bioeconomy's contribution to sustainable development is dependent on how it is implemented. A systemic monitoring system capable of dynamically linking human-environment interactions and many scales of analysis is required to verify that the EU bioeconomy transition fulfils overarching goals such as the Sustainable Development Goals. (O'Brien et al., 2017).

Identifying suitable sustainability indicators can be an essential step before developing and monitoring a sustainable bioeconomy (Bracco et al., 2019). Moreover, it is necessary to know driving forces, which provides essential information for monitoring activities (Kardung, 2019). On the other hand, unavailability of data, lack of granularity in available statistics respectively time-inconsistent data could cause gaps in Bioeconomy monitoring systems (Robert et al., 2020).

## Methodology

The paper is based on comparing selected research studies devoted to identifying indicators suitable to monitoring the bioeconomy.

The analysis is based in particular on the following publications:

- Public deliverables of the project "emPOWERing regional stakeholders for realising the full potential of European BIOeconomy."
- Public deliverables of the project "Monitoring the Bioeconomy."
- Articles written by Capasso & Klitkou (2020), D'Adamo et al. (2020) and Jander et al. (2020)

## Results and discussion

Monitoring and measuring the bioeconomy could be considered challenging but, on the other hand, a critical task. To develop a comprehensive tool or framework, it is necessary to establish a definition of the bioeconomy itself, which will be used to determining objects of investigation.



*Figure 1. Terms connected to monitoring and evaluation of bioeconomy according to selected research studies*

Source: own analysis based on studies mentioned in the methodology

As can be seen from Figure 1, there are many words interconnected with bioeconomy. If we take into account most frequent terms (with relative frequency above 0,5%), which are present in all five analyzed documents we can conclude that monitoring bioeconomy should be focused on sectors (1,58%), value (1,07%), indicators (0,69%), bio-based (0,68%), sustainability (0,58%), production (0,56%), use (0,54%) and stakeholders (0,5%).

In the case of sectors is necessary to identify those, which are bio-based. At first glance, this may seem like a straightforward task. However, as Ronzon and M'Barek, (2018) pointed out, statistics are often based on NACE classification, which does not

take into account explicit differentiation between bio-based and non-bio-based activities, while some sectors (as fishing and aquaculture, forestry, agriculture, manufacture of food beverages and tobacco, manufacture of paper) can be considered as bio-based, others are hybrid (using both biomass and other kinds of feedstock).

Sustainability can be considered an essential part and driver of bioeconomy potential. Therefore in evaluating and monitoring bioeconomy and potential, it is necessary to take it into account.

Under the term stakeholders, we can understand various groups of interested persons from policy-makers and scientists through entrepreneurs to the non-governmental sector, including engaged citizen groups. It is necessary to include all these groups in the development of the bioeconomy to ensure its success. At the same time, stakeholders also have an important place in setting up monitoring tools, and according to Zeug et al. (2019), their participation is the most appropriate way to identify critical objectives.

Value, production, and use could be considered a subset of term indicators, in which selection is the primary and essential component of monitoring the performance and benefits of the bioeconomy, and we deal with it in the next part of this paper.

### Indicators necessary to monitoring bioeconomy

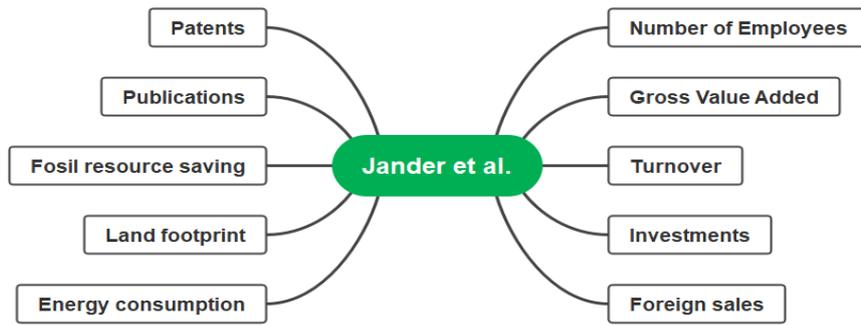
Researchers bring diverse methodologies to choose indicators to establish models devoted to bioeconomy monitoring and evaluation.



**Figure 2. Fundamental macroeconomic indicators to evaluate bioeconomy**

Source: based on studies written by Capasso, Klitkou (2020) & D'Adamo et al. (2020)

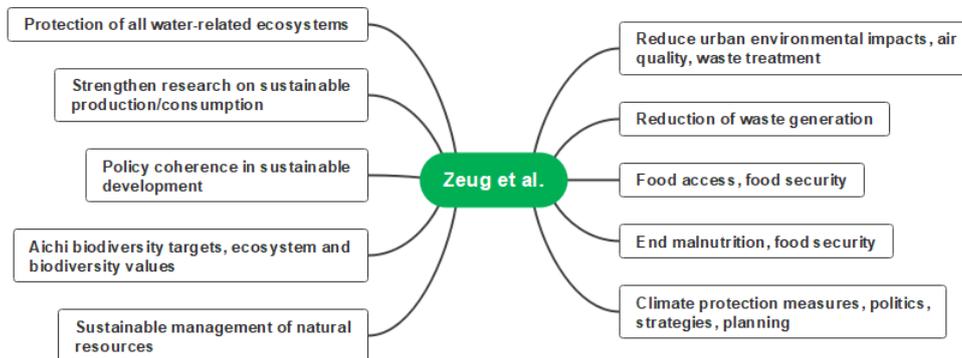
Essential macroeconomic variables (Figure 2) brings the possibility to compare different countries respectively to evaluate the development of bioeconomy status in selected regions by time ex-post. Data availability devoted to employment, value-added, turnover etc., is sufficient and in European Union also comparable thanks to Eurostat. On the other hand, the issue can be faced due to the identification of bio-based parts in hybrid sectors as data on higher hierarchies of NACE are necessary. The main disadvantage of such a model can be considered the impossibility of a deeper analysis of the development of the bioeconomy and its potential, and thus the absent possibility to design policies towards the future.



**Figure 3. Advanced macroeconomic indicators supplemented with primary environmental effects**

Source: based on a study written by Jander et al. (2020)

Jander et al. (2020) suggested supplementing essential macroeconomic variables (such as turnover, employment, value-added) with other investments and foreign trade, which allows a more detailed analysis of the impact of organic sectors on the region's economy. Moreover, the inclusion of science and research in biotechnology allows exploring the benefits and the status of the country concerning the bio-economy. In addition, the authors recommend including environmental indicators in the monitoring tools (Figure 3), which brings added value in the possibility of evaluating the added value of bioeconomy development.

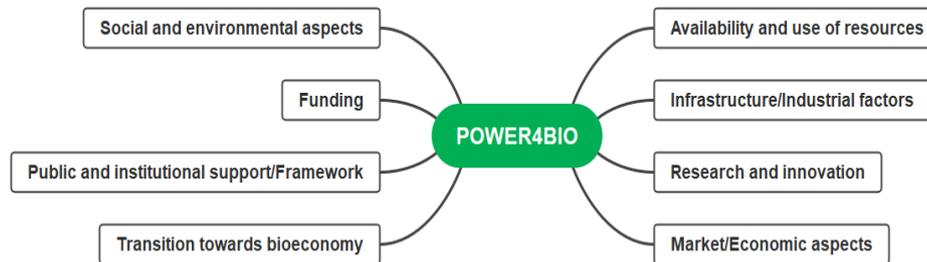


**Figure 4. Indicators based on Sustainable development goals**

Source: based on a study written by Zeug et al. (2019)

Another way to define indicators to evaluate and monitor effects and evaluation of bioeconomy is to connect with another development model. Zeug et al. (2019) suggest operationalising Sustainable Development Goals (at the level of sub-goals) while stakeholders identified corresponding components and key objectives (Figure

4). This approach brings a certain amount of subjectivity due to the definition of specific relationships and connections between bioeconomy and SDGs and targets. On the other hand, the availability of data can be considered a positive, as the topic of SDG is given relatively extensive attention.



**Figure 5. Indicators according to the POWER4BIO research project**

Source: based on a study written by CIRCE et al. (2019)

The more comprehensive approach is provided by large-scale research projects focusing on the bioeconomy. One of the most current is the H2020 project called *emPOWERing regional stakeholders for realising the full potential of the European BIOeconomy*, which brings discursive view not only on defining appropriate indicators to measuring performance and monitoring bioeconomy. As can be clear from Figure 5, researchers suggest methodology, which brings quantitative macroeconomic aspects together with research situation in bio-based fields, social and environmental aspects that enrich the analysis of the state of support and predispositions to the development of the bioeconomy. Another research project was held under the H2020 scheme called *Monitoring the Bioeconomy*, which suggests a more quantitative approach focusing on food and nutrition security, sustainable natural resource management, dependence on non-renewable resources, mitigating and adapting to climate change, employment, and economic competitiveness (Kardung et al., 2019). Such a comprehensive approach makes it possible to assess the state and development of ex post and comparison and brings discourse towards the creation of public policies supporting the development of the bioeconomy and sustainable development. On the other hand, the risk can be seen in the processing complexity of analyses based on such an approach and the availability or standardisation of obtaining quantitative data and the willingness of the institutions or persons concerned to cooperate with the research team.

## Conclusion

Setting up bioeconomic monitoring systems can be considered a challenging task that does not lead to consistent results. Some approaches work exclusively with fundamental macroeconomic indicators, others are linked to sustainability assessment systems, and others combine large amounts of either quantitative or

qualitative data. The lack of availability of statistical data and the issue of differentiation of bio-based production from individual sectors of the economy in national accounts statistics can be considered a clear problem in monitoring the bioeconomy.

It would be helpful to focus further analyses in this area on identifying the specific availability of data and consolidating them across regions and countries. It is also necessary to set up a standardised framework for evaluating qualitative indicators to ensure comparability.

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# Impact of the Next Generation EU on rural areas: First lessons from the selected national plans

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**Abstract:** The purpose of the paper is to assess the national plans under the EU's Next Generation EU recovery plan and particularly the Recovery and Resilience Facility. The method is based on a qualitative review of plans of the largest EU member states. The focus is on evaluating the way the rural areas are being targeted by the plans and what instruments are proposed. The research limitations are represented by the lack of details in the plans and the lack of research on the link between the Recovery and Resilience Facility and rural areas. The European Union is facing numerous challenges in a rapidly changing integrated global economy. On the one hand to get the economy in motion after COVID, while on the other aiming to transform the economic system to a more sustainable one, with core objectives including the mitigation of climate change and mainstreaming circular economy. These changes will have substantial repercussions on the economic structures and the economic sectors of the member states, including agriculture. The vision for the rural areas can, however, be a neglected subject. The practical implications of the research are that it can contribute to prepare rural areas to the optimal use of the resources. Social implications of supporting rural areas are the decreasing of disparities within the EU and strengthening of social and economic cohesion.

**Keywords:** Next Generation EU, Recovery and Resilience Facility, rural areas, national plans

## Introduction

Most member states have completed their national recovery and resilience plans (NRRPs) which are being assessed and approved by the European Commission followed by the adoption by the Council of the implementing decisions. Council to be able to draw the support from the Recovery and Resilience Facility (RRF). At the moment of completing this article 18 plans have been approved by the Commission, with sixteen having the implementing decision approved and ready to receive the first financial support.

The RRF instrument is part of the Next Generation EU (NGEU) assistance conceived to help member states overcome the impacts of COVID-19 on their economies. NGEU comes on top of the EU's Multiannual Financial Framework (MFF) for 2021-2027 of the EU budgets. In the final composition of the NGEU only a limited part will directly complement the traditional EU budget policies. The overwhelming share of the funding (90%) goes to the RRF, with €672bn (of which grants are €312.5bn and loans €360 bn). Or the remaining 10%, there is a €47.5 bn

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increase for Cohesion Policy (ReactEU); €5 bn in grants for research and innovation, funding for debt and equity in the InvestEU financial instruments; €7.5bn for rural development; €10 bn for the Just Transition Fund, and €1.9 bn for the Union's civil protection mechanism. Of course, this percentage shares look a bit different if we only look at the grants, in this case the RRF represents 80% of the grants.

The NGEU funds, be it for the RRF or the funds complementing existing policies in the EU budget are governed differently to the EU Cohesion policy or agricultural and rural policies, this is due to the particularities of the NGEU as a time limited emergency response fund, raised as an Externally Assigned Revenue under Article 21(2)(a) of the EU's Financial Regulation (Regulation (EU, Euratom) 2018/1046). This regulation imposes a different management system, namely central management rather than shared management, i.e. the European Commission manages and the beneficiary (or interlocutor of the European Commission) is the Central government, not the managing authorities in the regions or paying agencies for rural and agricultural funds. This has a number of implications for the governance of the funds. In addition, while originally the funds directed to expand existing EU programmes were going to have separate regulations, these have been integrated in the ordinary regional, agricultural and environmental regulations.

For the RRF, the governance and implementation rules are significantly different<sup>5</sup>, with important implications in terms of the way those funds will be affecting regions and rural areas. Unfortunately there are very few studies looking at the impact on rural areas of the recovery programme.

A first analysis has been performed by Valenza et al. (2021) who have analysed for the Committee of the Regions how the NRRPs have taken into account regional and local issues and involved the local authorities. The report sees in the RRF a regression from the principle of subsidiarity and an insufficient attention to territorial development. Also a CPRM (2020) report raises serious issues on the lack of involvement of local authorities in the design on the recovery instruments and the centralized nature of the programmes.

This paper gives a short overview on the role of the RRF and the way the NRRPs address specifically the rural dimensions, based on a review of the Spanish, Italian and French programmes undertaken by the authors. The rules of the RRF are presented in the regulation for Recovery and resilience facility<sup>6</sup> and the guidelines produced by the European Commission<sup>7</sup> and have been summarised and analysed by Nuñez Ferrer et al. (2021).

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<sup>5</sup> For more details please refer to Nunez Ferrer J. and F. Corti (2021)

<sup>6</sup> Regulation 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility, OJ L 57, 18.2.2021, p. 17–75

<sup>7</sup> All guidelines are published at [https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility\\_en](https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en)

### **Review on the role of the RRF and its impact on rural areas**

The role of the RRF is multiple and complex. Officially, based on the regulation establishing the facility, the objective is to counter the impact of the COVID pandemic. However, the recovery package does not aim to bring the economy back to the situation before the pandemic, but to redirect the economy based on the Green Deal objectives and a recognition that some of the most affected countries already needed considerable structural reforms and were not recovering from the financial crisis a decade ago. The aim is thus to direct the economies towards cleaner, more circular, digital, and more just economic structures aligned with the climate objectives. This is also the reason for the additional ‘resilience’ objective in the name.

The main requirements based on the regulation and guidelines of the recovery and resilience facility are (from Núñez Ferrer, 2021):

#### **a) Requirements**

- to contribute to the seven European Flagships: 1) Power up, 2) Renovate, 3) Recharge and Refuel, 4) Connect, 5) Modernise, 6) Scale-up and 7) Reskill and upskill
- to allocate 37% of the RFF funding to climate investment based on the methodology for climate tracking
- to dedicate 20% of the funding to the digital transition based on the methodology for digital tagging
- to contribute to the strategic autonomy of the Union
- to explain how the plans mainstream gender equality and equal opportunities for all

#### **b) Macroeconomic and reform requirements**

- to ensure consistency with the Country Specific Recommendations (CSR) to the member states emerging from the European semester
- to introduce reforms geared to improving conditions for the business sector
- to introduce reforms to improve the quality of public administration
- to adopt more efficient public investment processes, including expanding the effective use of public-private partnerships
- to introduce measures to avoid aggressive tax planning that distorts competition between firms.

#### **c) Overarching new environmental conditions**

- to ensure that the programmes ‘do no significant harm’ to any of the six environmental objectives as defined in Article 17 of the EU Taxonomy Regulation.

These represent a large number of objectives going well beyond the traditional EU funds and give member states extraordinary leeway on the areas to spend the money.

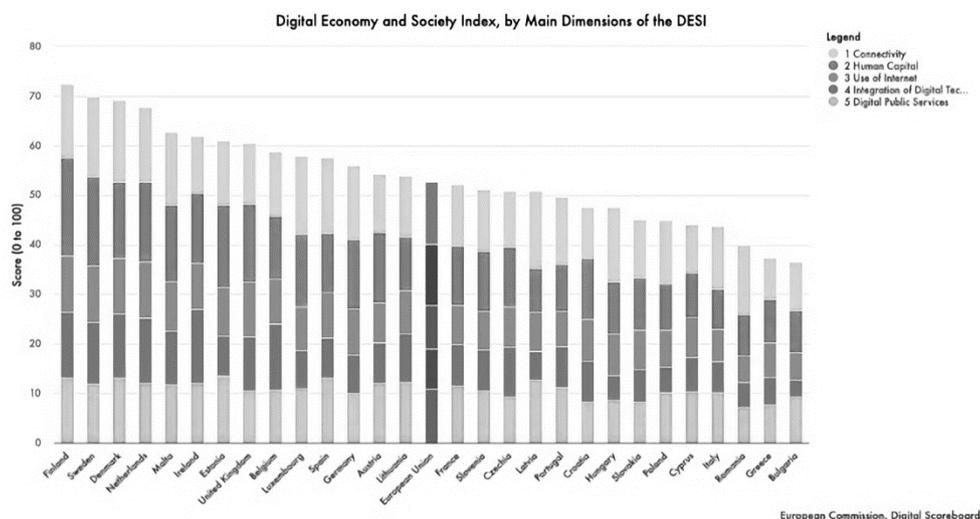
In addition, a particularity of this support is that the support does not need national co-finance.

However, there are strict conditionalities attached to the use of the RRF. The guidelines require that 37% of the funds are spent in investments addressing climate and 20% to digitalisation. It also requires that the macroeconomic recommendations in the Country Specific Recommendations (CSRs) of the European Semester are addressed.

The RRF is thus not directly or necessarily addressed to territorial imbalances and this has been deplored by Valenza et al. (2021), but it is important to understand that the RRF does not need to address every problem of the economy in every sector. The RRF is additional to the normal EU budget policies, the national budgets and also the additional support by NGEU to regions (REACT-EU) and rural development.

Nevertheless, the priorities of the RRF and the focus of the funds will have an impact on the development of the rural areas, their sustainability and future viability. This is because the RRF will be a major investment tool and the choices may affect the rural areas considerably. In the following areas of investment and reforms the RRF can have a major impact on the rural areas: transport, digitalisation, education, and administrative and judicial services. The way rural areas will be connected to the rest of the economy and the opportunities the funds may develop for the citizens of those areas will impact their future.

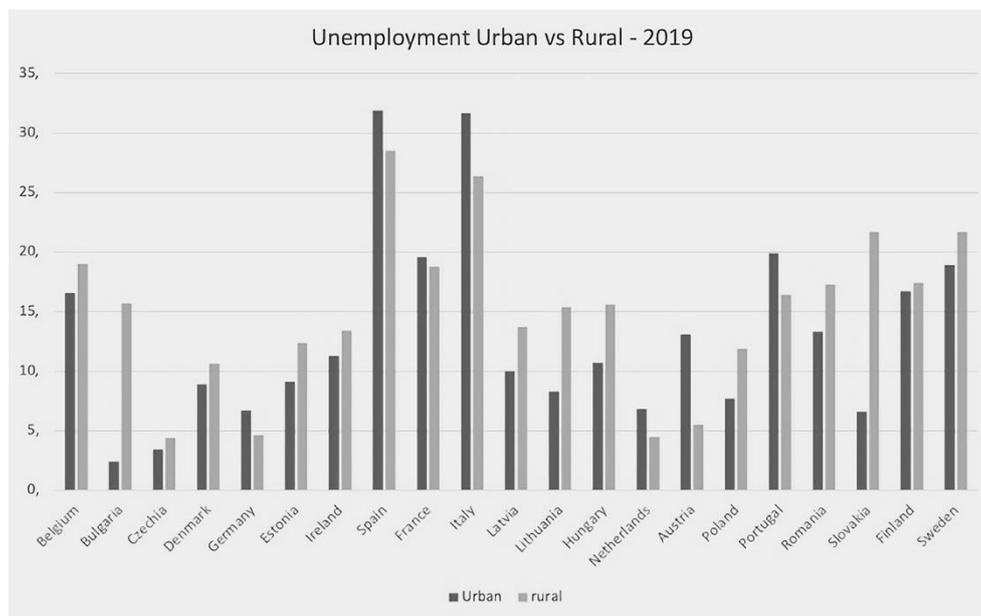
In the area of digitalisation several countries trail behind, and the most affected areas are always rural. In the digital scoreboard by the European Commission the very different coverage between member states is clear.



**Figure 1. Digital scoreboard index**

Source: Extracted from, European Commission, Digital Scoreboard <https://digital-agenda-data.eu>

Another telling graph on the situation in rural areas, is the unemployment level. For many countries, and in particular poorer countries the unemployment level in rural areas is particularly high. It is interesting to note that in some countries, the worse situation is urban, but this is also the result to migration out of the rural areas in the last years, as the rural areas lost services and opportunities during the financial crisis. The impact of the financial crisis for rural areas has been described by Sánchez-Zamora and Gallardo-Cobos (2020). The study shows how economic disparities between regions, urban and rural and even rural to rural regions have increased.

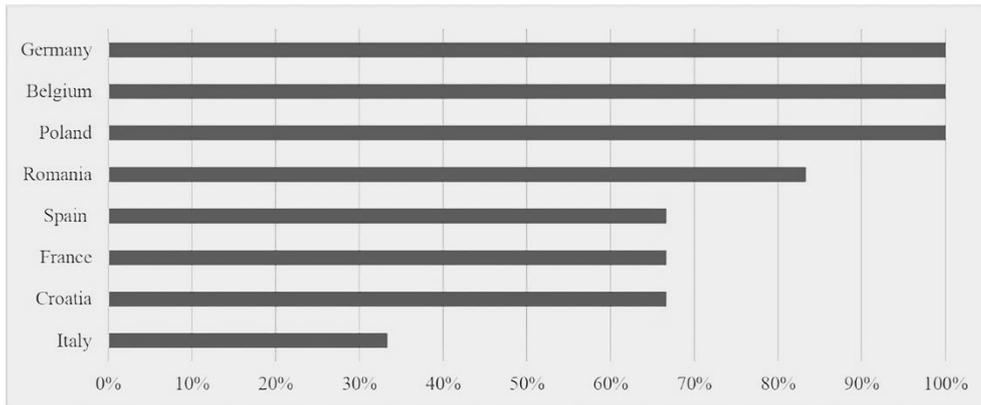


**Figure 2. Urban and rural unemployment in the EU**

Source: Eurostat data.

A large recovery programme aiming at sustainability and reducing the impact of the financial crisis as well as COVID would be expected to show a particular sensitivity on how the actions affect territorial cohesion between and within regions. How the RRF will focus on rural areas is thus important. We have reviewed programmes by main beneficiaries of the funds to understand how the countries addressed rural areas, namely in Spain, Italy and France.

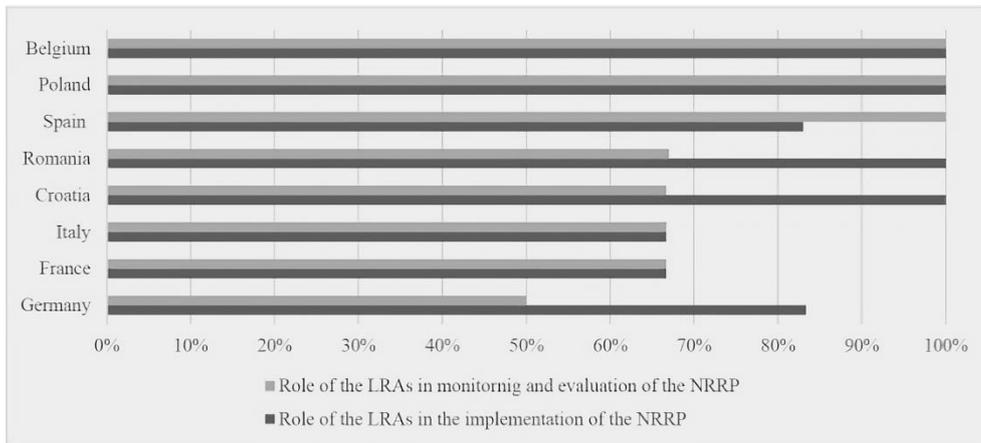
From the analysis by Valenza et al (2021) several countries have not addressed sufficiently the challenges for regions and rural areas. Their analysis has led to an index presenting an estimated level of involvement of local and regional authorities (LRAs) in the drafting of the RRF. This varies across the countries, but shows that the countries with the largest financial support are those with the lowest participation in the sample of countries reviewed.



**Figure 3. Involvement of the LRAs in the preparation of the NRRPs**

Source: Valenza et al. (2021)

Also the role of the LRAs in implementing and monitoring and evaluating the RRF is very different across the countries. Their role in the implementation is generally high, because many regional offices are responsible to implement many national policies and EU programmes, the same ones will be used for the RRF.



**Figure 4. Role of the LRAs in implementation, monitoring and evaluation**

Source: Valenza et al. (2021)

### **The presence of rural development problems in the NRRPs**

As mentioned above the rural areas are generally not addressed with specific measures explicitly targeting them, but will be affected by the priorities the programmes put in developing infrastructures, such as for transport, digitisation and also in the investments in education, training and coverage of essential services (justice, health, policy etc.). This section checks the Spanish, Italian and French programmes for such aspects.

### **The Spanish National Recovery Plan and rural areas**

The Spanish programme<sup>8</sup> is notable for the sheer number of measures covering many social, economic and environmental issues. Amongst those objectives, the plan claims to have 130 measures affecting rural areas. However, many of those are nationwide measures that are relevant in the sense that these also impact rural areas. One of the core concerns expressed in the programme is rural depopulation, and Spain has one of the worst declines in rural population in Europe as indicated in ESPON (2020). The plans aim to reverse the trend by increasing the quality of services and infrastructures in the rural areas, in particular education and digital infrastructures, such as broadband access.

More specifically, it is in component number 3 (“Environmental and digital transformation of the agri-food and fisheries system”) of the national plan, where the measures directly affecting rural areas are included. This will take place through the ‘Strategy for the Digitisation of the Agri-Food and Forestry Sector and the Rural Environment: development of actions to support the digitalisation and entrepreneurship of the agri-food and forestry sector and the rural environment’. The objectives and the completion date of the measures (reforms and investments) are coherent, and this is an ambitious measure, as it consists of proposing a second action plan, for the correct adoption of the Spanish Strategy for the Digitalisation of the Agri-food and Rural Areas, adopted by the Spanish government in March 2019.

Going into more detail, in order to tackle rural problems, the Spanish government proposes what it calls ‘tractor projects’, which include the creation of innovation centres in rural areas and the promotion of local entrepreneurship (Belinchón, F., 2021). In turn, digitisation will play an essential role, as the Spanish government’s goal is for 100% of the national population to have 100 Mbps coverage by 2025, which directly affects rural areas.

Emphasis is placed on investments in innovation hubs for agriculture and support to precision agriculture. However, there are several measures where the budgetary part devoted to rural policy is not specified. The national plan contains also funds on softer measures which may impact rural areas and have to be further assessed. On

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<sup>8</sup> Gobierno de España (2021), *Plan de Recuperación, Transformación y Resiliencia - España Puede*

measures to improve access to public services, the plan wishes to assist less populated areas, but the administrative reforms often will not allocate funding from the RRF, thus it is unclear what the budget will actually be.

It is interesting that the Spanish plan considers local actors essential for the adoption of measures in rural areas, also seeking that member of the public and private sectors act jointly, in order to increase the efficiency of the measures adopted (Asenador, S. H., 2021).

Overall, the measures proposed by the Spanish government are encouraging, but their success or failure depends on the correct adoption of measures and the existence of good governance both at the national and local level.

### **The Italian National Recovery Plan and rural areas**

The Italian NRRP<sup>9</sup> announces specific actions to promote sustainable agriculture and circular economy, complementing the EU budget and RRF additional Rural Development assistance. The plan makes also concrete reference on the fourth pillar (“territorial and social cohesion”).

There is also considerable emphasis on technical assistance for local authorities which could help rural areas. Amongst the instruments we can find:

- One of the first objectives is to improve connectivity in rural areas.
- Other missions address directly rural areas problem with concrete investments (i.e. Investment for green communities).
- Regarding circular economy, in addition to the Italian ‘Circular Economy Package’ the PNRR aims to fill the structural gaps that hinder the development of the sector.
- Support to value chains to develop a more sustainable food sector.
- Support to develop of the logistics for agricultural sector.
- Introducing renewable energy and energy efficiency infrastructures in agricultural buildings.
- Integrated projects combining circularity, mobility, and renewables (Green islands).
- Support for the development of precision agriculture.

However, contrary to the more spread distribution of the funds in the Spanish Programme, the Italian programme has a clear focus on key infrastructures, such as rail transport. Less emphasis is placed on supporting smaller actors.

Nevertheless there are specific actions envisaged. The Italian plan addresses indirectly rural issues, for example through the component called "culture and tourism 4.0". Although there is no direct mention of the effects that the reforms proposed by the plan will have on rural areas, a series of investments are foreseen that will affect them. Specifically, through the investment for the systematic enhancement process for historical rural buildings (of private individuals or third

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<sup>9</sup> Repubblica Italiana (2021), *Piano Nazionale de Ripresa e Resilienza*

sector entities) and landscape protection. These measures are expected to have a direct effect on local economies and aim promote sustainable tourism in rural areas by: a) offering programs to enhance the identity of historic parks and gardens, with a contribution to improving the quality of life; leveraging cultural heritage; and promoting a vast regeneration action of historic parks and gardens. In turn, the component called 'Sustainable agriculture and circular economy' also aims, to support the sustainable and resilient development of rural and mountain areas, to influence the development of rural areas.

In addition, the digital transformation, which includes the modernisation of agricultural machinery, among other areas of investment, could have an effect on rural areas, since, as mentioned by Moreschi (2021), there is an increasing connection between cultural heritage, tourism, and agricultural production.

Finally, making an overall assessment, it can be said that the Italian plan does, despite its emphasis on large infrastructures, take into account the needs of rural areas. However, the fact that most of the reforms in the plan are not directly focusing on rural areas make it difficult to measure to what extent these will actually benefit.

### **The French National Recovery Plan and rural areas**

The measures in France<sup>10</sup> are more limited, also because the RRF funds are smaller. The programme focuses on the green transition and has a number of measures that are relevant to rural areas. There is a commitment to green infrastructure and mobility investments in rail connections, although the rural dimension is not clear.

For energy, rural electrification is presented as a key objective. The investment programme number 7 of component 3 called "Strengthening the resilience of electricity networks and energy transition in rural areas" addresses the French rural needs.

The plan calls for an energy transition in the rural areas by building the necessary renewable energy infrastructures. France also proposes to invest in the supply network to and cut the power shortages which some parts of France suffer.

Another priority clearly addressed at rural areas is the investment in the connectivity networks to improve the conditions for companies and citizens and make the areas more attractive.

What is clear is that France is not considering the RRF funding as having any large role to address the situation in the rural areas. That said France has its own national recovery support of €100 billion "France Relance"<sup>11</sup> launched for 2020 to 2022 which includes a considerable number of funds dedicated to improve access to services in local areas, including rural.

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<sup>10</sup> Gouvernement Français (2021), *Plan National de Relance et Résilience 2021*, available at [https://www.economie.gouv.fr/files/files/directions\\_services/plan-de-relance/PNRR%20Francais.pdf](https://www.economie.gouv.fr/files/files/directions_services/plan-de-relance/PNRR%20Francais.pdf)

<sup>11</sup> <https://www.gouvernement.fr/les-priorites/france-relance>

## Conclusions

The RRF is not conceived to address specifically rural areas. Nevertheless, many rural areas are suffering from a socio-economic decline and an exodus of the population. The impacts of these changes need to be managed if not by the RRF, by other national and EU programmes. The RRF, however, can have considerable impacts on rural areas depending on how the government handles the development of cross-national infrastructures and their link to the rural areas. The impact to the rural areas of EU and national interventions requires an analysis on the level of additionality the RRF creates above other public funding and understand the combined impacts with a clear view on the objectives for these areas. Where the attention should lie, is on the actual investments in infrastructures that can offer a lifeline for the rural economy, and this is in digitisation, education, access to services and transport, other support has already dedicated funding from other sources. All the RRF programmes reviewed mention the rural areas, but the de-facto support needs to be monitored and the link and complementarity with other programmes guaranteed.

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# PERCEPTION OF STAKEHOLDERS ON DEVELOPMENT OF REGIONAL BIOECONOMY STRATEGY: THE CASE OF NITRA REGION

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## Abstract

**Purpose:** The bio-based economy is a powerfully emerging sector with huge potential and providing employment for many people across the whole Europe. There are still many European regions, including Nitra region in Slovakia, that do not take full advantage of their potential. The H2020 project POWER4BIO aims at supporting these regions in boosting the bio-based economy in their areas and analysing the transition from a realistic and competitive standpoint. Therefore, one of project goals was to ensure the critical mass beyond the consortium by involving additional stakeholders for fostering a dialogue between the consortium members and regional actors.

**Design/methodology/approach:** This paper introduces the implementation of POWER4BIO methodology for guiding development of regional bioeconomy strategy in Nitra region.

Based on the initial knowledge status of the regional situation and the regional stakeholder map, further methodological steps led to two-stage approach in selection of the group of relevant stakeholders. The workshop and questionnaire survey were realized within the POWER4BIO project in 2019-2020. All stakeholders were contacted firstly personally and then asked for their responses on an electronic survey translated in the Slovak language, and the respondents were provided with detailed explanations and instructions. The sample of stakeholders consisted of representatives of four different categories - practitioners/companies, associations of producers, providers and legal entities, policy makers, and academic experts.

**Findings:** Most of the responding stakeholders declared the appropriate knowledge of the state-of-art dedicated to bioeconomy issues. Responding stakeholders evaluated agriculture as existing, as well as the most promising sector from the point of view of current value chains. The survey has shown on the one hand a lack of private, local and regional financial schemes and funding mechanisms, and on the other hand a lack of knowledge of respondents about available models of public funding at the national and EU level. It has been also evident that the stakeholders mostly rely on public funds and government as a managing authority.

**Research limitations:** The used approach and methods have limitations due to accuracy of the stakeholder groups and because of prevailing qualitative character of the obtained data and information. Thus, we did not conduct standard statistical quantitative analysis. On the other hand, the strength of this approach and method was that the project team members could ensure stakeholders from different categories were properly engaged in a meaningful way in the process of development of regional bioeconomy strategy, and provided with a complex policy and field assessment framework.

**Key words:** bioeconomy development, multi-actor approach, stakeholders' engagement, participatory methods, regional bioeconomy strategy

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## Introduction

Bioeconomy has become a crucial issue in development planning and in research and innovation policy making in many parts of the world including the European countries. Bioeconomy strategies and policies are in different developmental stages and the international, national and regional policy making processes have been more or less complex, partly with changing perspectives. Besides international and national initiatives, a number of regional activities have been started and established, followed by the evolving of scientific as well as societal debates on different aspects related to the bioeconomy strategies (Von Braun 2014; Meyer 2017). The European Bioeconomy Strategy and its Action emerged in 2012 from the Innovation Union and Resource Efficient flagship initiatives of the EU 2020 strategy, recognising that the bioeconomy plays a central role in addressing a number of key interlinked challenges (EC 2012). In 2017, a Review of the Bioeconomy was carried out and concluded that the European Bioeconomy Strategy has substantially delivered during the past years on its objectives, leading to the creation of new bio-based value chains, to the development of several national bioeconomy strategies, of dedicated regional platforms and of stakeholder panels, all promoting the development of local bioeconomies valuing local resources and adapted to local needs (EC 2018). One of the key results of the European Bioeconomy Strategy has been to bring the bioeconomy principles and cross-cutting objectives to the attention of national and regional policy-makers. A substantial number of European regions have also included bioeconomy-related priorities in their Research and Innovation Strategies for Smart Specialisation (RIS3). Bioeconomy is an extremely interlinked and diverse world, characterized by strong connections between sectors and with a significant impact on the economy in the European countries (Assobiotec and Intesa Sanpaolo 2020). The pandemic caused by the SARS-COV2 virus has made it more evident that the models of economic development need to be rethought with a greater focus on sustainability and respect for the environment, and the crucial role can be played by public stakeholders, especially in regional and local contexts.

## Research Background

Most of the policy strategy developments in bioeconomy have already adopted a more or less participatory approach by stakeholder conferences, workshops, and surveys. The new European Bioeconomy Strategy explicitly calls for strategic and systematic approaches to bringing all stakeholders together in an attempt at policy coherence (Zeug et al. 2019, p. 5). The development of a bio-based industry is a long-term complex process involving many stakeholders on multiple levels and sectors that could have large impacts on the region. Therefore, the identification of the most appropriate strategy should be based on the involvement of all stakeholders, preferably through a multi-actor approach (Sisto et al. 2016, p. 43; Diaz-Ruiz et al. 2019, p. 250). Multi-actor approach is a participatory research process in which various actors contribute with their knowledge and experience in different ways (Munda 2008, p. 20; Garmendia and Gamboa 2012, p. 111). This integrated approach

involves an understanding of technological aspects, economic constraints, social behaviour, the legal and institutional framework, and contextual practices (Campling et al. 2021, p. 2). It can help in decision-making procedures and should empower stakeholders to have an impact on the policy (Dodds and Benson 2010, p. 2). However, this might be quite difficult in regions where a participatory tradition is lacking (including Slovakia), therefore the stakeholders need external expert support that is able to boost their interactive participation in policy-making procedures.

The observed shift to participative dialogue in some strategies is reflected in the establishment of stakeholder forums such as the EU Bioeconomy Panel with members of four stakeholder groups: producers, enterprises and industry; universities, research organisations and the scientific community; public administrations; and civil society. The main objective of these bodies is to support the implementation process of the strategies and to facilitate interactions between different policy areas, sectors, and stakeholders. Their influence on the alignment of overall strategic goals is therefore unclear, and the involvement of end-users still needs to be developed (Meyer 2017, p. 15). Regarding managing innovation in the field of bioeconomy, seven relevant stakeholders' groups are distinguished: policy makers, competitors, universities and research institutes, suppliers, users and customers, consultants, and other actors in the value chain including organizations from previously unrelated industries (Van Lacker et al. 2016, p. 63-64).

Within this framework, the H2020 funded project POWER4BIO was established with the main aim to empower regional stakeholders to boost the transition towards bioeconomy regions in Europe by providing them with the necessary tools, instruments and guidance to develop and implement sound sustainable bioeconomy strategies. The basic principles of multi-actor approach were implemented: (1) focus on the real problems or opportunities that stakeholders are facing; (2) engagement of stakeholders with complementary types of knowledge (scientific, practical and other) which have to join project activities from beginning to end.

## Materials and methods

This paper introduces the implementation of POWER4BIO methodology for guiding development of regional bioeconomy strategy in Nitra region (POWER4BIO 2021). The project methodology contributes to identifying specific regional assets and *how-to-develop* tips on developing/strengthening its own regional bioeconomy strategy. The main objective of this paper is to explain the individual steps realized in the process of collecting and assessing the perceptions of relevant stakeholders empirically, using the multi-actor approach based on developed project methodological tool, briefly present the two-stage survey results, and to point out the pros and cons of the participatory approach.

The methodology includes both analysis of the regional bioeconomy potential and the development of a stakeholder engagement strategy. Assessing the bioeconomy potential in a region considered the full range of factors to obtain the complete picture. For this aim, a general set of factors were identified seeking to avoid as much as possible subjective parameters and looking for reliable data.

Additionally, the aspect considered have taken into account the need to be as easy as possible to understand by a large number of stakeholders with different profiles and expertise and provide a useful and comprehensive description of the bioeconomy situation in the region. The set of factors was then grouped in eight categories to make it more accessible for the final user: availability and use of resources, infrastructure and industrial factors, transition towards bioeconomy, public and institutional support/governance/policy framework, funding, research and innovation, market/economic and social and environmental aspects.

Based on the initial knowledge of the regional situation and status, and the regional stakeholder map, further methodological steps led to two-stage approach in selection of the group of relevant stakeholders. The methodology combined a visioning workshop (Stage 1) and four series of questionnaire surveys (Stage 2). The vision generating phase is essential, and participatory workshops with stakeholders could increase the level of acceptance of the results. We carried out intentional sampling procedure related to the project aims and we contacted stakeholders who had showed interest on bioeconomy issues. We classified stakeholders into four basic categories. Table 1 shows the number and structure of stakeholders participating in both stages.

**Table 1. Participating stakeholders in individual research stages**

Stakeholder category		Stage				
		1	2a	2b	2c	2d
Public administration		3	2	1	-	-
Research and education		10	1	1	1	1
Business	companies	6	7	2	7	4
	associations of producers/providers	2	6	5	4	4
Civil society		3				

Source: own project survey.

We first contacted and invited stakeholders to participate in the first stage and after that they were asked to continue in the second stage, and also to recommend other relevant stakeholders from their category. Unfortunately, it was very difficult to get decision-makers and representatives of civil society involved. The traditional structure of a dialogue with stakeholders (workshops, questionnaires) does not guarantee the attendance and participation of the same participants in all of them (e.g. Kok et al. 2011). On the other hand, the structure of the participatory approach described in this paper enabled stakeholders to contribute in the whole process from the vision's setting to the definition of strategy's priorities.

The final meeting lasted two days and was organized as an online cross-visit in Nitra region. The group of stakeholders was completed by a number of representatives from the POWER4BIO project consortium and by external registered

participants from different stakeholder categories. Table 2 provides an overview of basic data about all mentioned events and activities.

**Table 2. Overview of basic data about project events and activities**

Event/activity	Length (days)	Number of participants*	Main results
Visioning workshop	1	30 (6/24)	Consensus on main regional bioeconomy drivers and focus areas, identification of barriers and challenges
Questionnaire surveys	30	46	Reflection of opinion of stakeholders well acquainted with the regional situation (8 topic areas)
Cross-visit	2	58 (33/25)	Improved identification of strategic priorities, proposals of concrete actions and mechanisms

\*Including participating members of the project consortium.

Source: own project survey.

The main objective of cross-visit was to motivate participants to contribute to presented information and ideas, and to share their experiences in order to improve the concept of the regional bioeconomy model. The used methodology included a mix of tools, e.g. moderated discussion, chat (during the meeting), mail communication (after the meeting), and mind mapping method using software tool (during and after the meeting).

## Results and discussion

Visioning workshop participants agreed that a non-existent state or regional bioeconomy strategy is a key burden for the transition to this economy model. Subsequently, the main features of the bioeconomy and its potential in the Nitra region as well as in Slovakia were defined through various brainstorming methods. Separation and use of municipal waste, unused food and food production residues, as well as an interdisciplinary approach to tackling value chains, industrial symbiosis, changes in consumer thinking and behaviour, responsible water management, legislative optimization, the development of bioplastics, degradable and compostable packaging as well as social aspects such as creating conditions for the development of social agriculture were considered as the main potential bioeconomy drivers. The areas of agriculture, forestry, food and renewable energy were considered as focus areas for bioeconomy development in the Nitra region. Key problems identified by the respondents were funding, demand for organic products, the biomass market, the availability of conversion technologies, valorisation of by-products, and waste management. This workshop was also used to discuss and identify regional barriers and challenges for bioeconomy development.

The purpose of the second stage of the survey was to add critical mass beyond the project consortium by bringing additional stakeholders, particularly practitioners,

into continuous contact with project activities. In addition to map the regional bioeconomy status, the aim was to include market players who are well acquainted with the regional bioeconomy situation into the survey which covered eight topic areas (mentioned in chapter Materials and methods). The majority (56%) of the respondents believed that there was no officially approved bioeconomy strategy in their region. Regarding the most crucial sector of focus in the development of a bioeconomy strategy, 11 out of 16 respondents identified agriculture as the area of leading importance, followed by forestry, the food industry, the renewable energy sector, nature tourism, and recreation.

When asked to identify a candidate for an entity that could oversee the development of a bioeconomy strategy, respondents favoured a multisector approach, with the most prominent proposal calling for the development of the strategy by a team of experts assembled jointly by the respective ministries of the economy, agriculture, and environment. Respondents recommended that the strategy should be developed in close consultation with regional and municipal governments, as well as the professional, academic, and scientific communities. Most respondents selected 'financial problems' and 'lack of sufficient demand for advanced bio-based products' as most prominently hindering the use of agricultural residues in bio-based value chains, while the three most important actors in the value chain relating to agricultural residues were identified as farmers, universities, and industrial facilities. Respondents gave similar answers in the case of conventional arable crops and energy crops, with biomass trade and logistics/transportation additionally identified as problems in the case of energy crops. There was other significant consensus in the case of industrial wastes and by-products (most respondents identified the availability of conversion technology) and wastes of livestock (respondents identified 'financial problems' and 'logistical and transportation problems'). Respondents identified biofuels and food products as the most important currently available products generated from bioresources in their region. Additionally, almost all respondents believed that high costs and a high risk of failure were the primary challenges to greater market introduction.

Respondents gave a wide variety of answers when asked to identify the most significant value chain in their region but identified agriculture as the most significant sector both currently and in its potential for future expansion, and food products and biofuels as the most widely preferred products. 10 of the 16 respondents identified 'deepening mutual communication and knowledge transfer' as the most important area of development for increasing the potential for collaboration between different regions, and 8 out of the respondents selected 'creating joint research and development actions together with a combination of private and public financing models' as the second most important. With regard to the financing of bioeconomy projects, 7 respondents identified the agriculture sector as already receiving external funding, with the national government as the most important source of external funding. Respondents identified 'structural funds and their implementation programs,' 'H2020 through debts and equity financing via the EIB's InnovFin financial programme,' and 'H2020 through grants' as the most important funding sources. Concerning the benefits and drawbacks of public and private funding,

respondents identified shorter approval time as the primary benefit, and 'difficulties related to ending up the private investment,' 'not efficient amount of money to cover indirect costs,' and 'complicated prediction of funded areas' as the bottlenecks of private funding. The primary benefit of public funding was identified as its helpfulness during financial gaps, while its main drawback (7 respondents), was the duration of the administration process associated with these funds.

## Conclusions and recommendations

The paper shows that the multi-actor approach could be an effective tool to manage in a participatory way the development of regional bioeconomy strategy. However, the process (and its results) has a number of both advantages and disadvantages. The first advantage of this approach is that the project team members could ensure stakeholders from different categories were properly engaged in a meaningful way in the process of development of regional bioeconomy strategy, and they were provided with a complex policy and field assessment framework. Secondly, it builds trust and relations between different stakeholder groups, as well as it generates positive outcomes, like new partnerships, contacts, and extended knowledge about funding opportunities etc. Moreover, using participatory methods helps stakeholder groups to identify their priorities, their positions on key issues, and to think about future perspectives from their point of view. It also helps decision-makers better to understand what stakeholders want and why.

On the other hand, the used approach has limitations due to accuracy of the stakeholder groups and because of prevailing qualitative character of the obtained data and information. Future steps should include higher number of participating stakeholders and the combination of more quantitative and qualitative methods of data collection. Furthermore, the division of stakeholders into a core group of important ones and a group containing less crucial actors, as well as multiregional insights accompanied with case studies offering microlevel perspectives would significantly contribute to the development of targeted regional bioeconomy strategy and policy. In order to transform identified strategic priorities in concrete action plans, the identified barriers should be analysed more in detail with the objective clearly to define support actions and mechanisms, with management responsibilities and the time reference period. Finally, it can be concluded from the demonstrated experience in the POWER4BIO project that although this approach is logistically complicated and methodologically challenging, combination of various participative methods can support the process of creating consistent scenario of bioeconomy development in the regional context. Indication of some disadvantages can help to avoid potential pitfalls in the future implementation of multi-actor approach.

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## PRECISION AGRICULTURE (PA) SUPPORT OF INCREASING AGRICULTURAL PRODUCTIVITY

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**Abstract:** This work describes the increasing agricultural productivity challenges in the context of precision agriculture (PA) application in Colombia. To carry out the development of the research, we analysed the application of artificial intelligence (AI) projects in the country. So, performance evaluation metrics considered, both for efficiency, quality in the learning, classification and cost-benefit. Some contributions identified in the development in this work are: A high effectiveness in the precision agriculture system using artificial intelligence techniques in the detection of healthy and infected leaves and the notable decrease in time to detect healthy and infected leaves, increased food security and most likely higher profits to the farmer.

**Keywords:** Agricultural productivity, Artificial intelligence, Precision agriculture, Potato crops, Security foods.

### Introduction

Nowadays, agricultural development plays a major role in improving of life quality in all countries. The precision agriculture (PA) is an innovator and optimum field level management strategy and can be applied in different agriculture crops; this method aims to improve the productivity of resources on agriculture fields using information technology IT (Alcaraz, Jimenez 2018, p1). This work shows the need to formulate strategies to improve the quality of crops, reduce the impact on the environment and increase quality life. Given that the current trend is to align the agricultural sector undertakes with the continuous increase and development and application of new technologies. Reviewing the Colombian environment, it is evident that the immersion of information technology IT is one of the best lessons learned to improve the quality of life in the rural community and especially the use of solutions such as PA. Of course, from the current view of PA as a global trend that implies an emerging technology for agricultural and industrial purposes (Sanchez 2019, p2).

In Colombia PA is used as a management strategy that employ a technology cheap to improve decision-making in crop production. The application of PA to different tools such as the Internet of Things (IoT) facilitates the application of traditional agronomic knowledge or methods in a precise and automated way.

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## Literature review

According to the International Society of Precision Agriculture (ISPA), PA is a management strategy that collects, processes and analyzes temporal, spatial and individual data and combines it with other information to support management decisions according to the estimated variability, and thus improve efficiency in the use of resources, productivity, quality, profitability and sustainability of agricultural production (Herrero et al. 2016, p.3). Precision Agriculture (PA) refers to the use of technology to collect and process data from different electronic and optical devices and geographic positioning systems (GPS) to carry out targeted cultivation tasks just in time, with the required doses of the inputs to monitor them (Sanjeevi 2020, p.5). Thanks to the AP, producers can make more efficient decisions about the seeds they are going to plant, the field where they are going to sow, and they are even able to predict the yield of the harvest, which makes the work much more precise (Nicol 2021, p.2). A considerable number of publications have been found that discuss the application of IT in precision agriculture. It was detected that the implementations were driven on applying the technologies in some of the agricultural activities. In our case study: Potato crops in Colombia, the strategies of application of PA is around florescence stage.

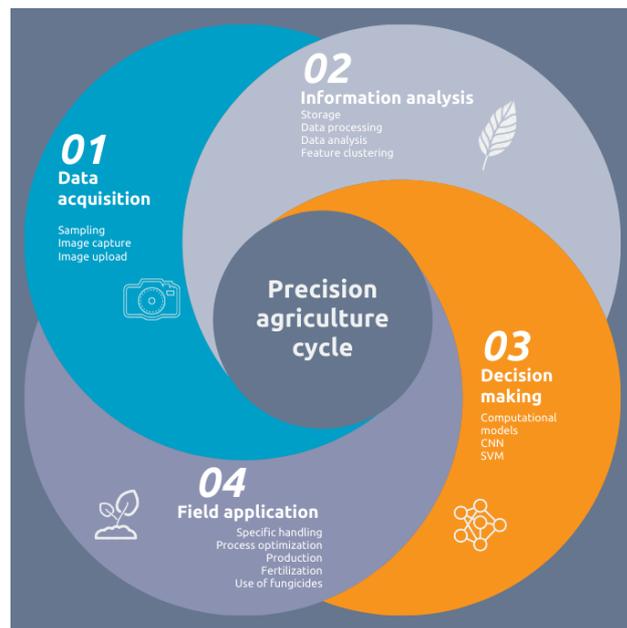
## Methodology

We recommend that application of PA techniques enables a reduction in the amount of fertilizers and other agrochemicals, the countries can have enormous benefits in terms of reducing greenhouse gas emissions and less pollution of the soil and bodies of water. The goal is provided knowledge, best practices and strategies related about the main information technologies used in PA; and as this strategies can be employed in our country.

Agriculture in Colombia has always been a work of inheritance, the grandparents taught their parents and then their children, they brought them all the knowledge they had learned over the years. This is a slow development, but it has reached a satisfactory performance point, which is why most farmers dominate their daily life. However, in countries that have historically invested in the development of engineering for their applications in the field, they have discovered advances that allow us to achieve productivities three to five times greater than that of our own country. In Colombia, there are some PA applications that allow optimizing the production, fertilization and pest control process in oil palm, rice, coffee, sugar cane, tomato and potato crops, the latter being the main source of income. in cold area of the country. However, there are few or no studies on the benefits in the field in the application of PA specifically in potato crops. For all these reasons, PA is perhaps the most important pillar of sustainable agriculture. It is essential to adopt these new production models in order to guarantee sufficient agricultural production. The proposed PA cycle for potato crops could be summarized in the 4 stages shown in Figure 1:

- ⇒ *Information acquisition: which allows the collection of data through different sources. Agroclimatic data, harvest data, soil sampling, phytosanitary fertilizers.*
- ⇒ *Information analysis: which allows evaluating the evolution and incidences of the crops. Generation of predictive models based on historical data and current data.*
- ⇒ *Decision-making: decision-making for the control and prevention of crops.*
- ⇒ *Application: Crop Protection, Monitoring and Collection.*

**Figure 1. Proposed cycle for PA and applications in Colombian agriculture**



Source: Authors.

The proposed cycle begins with the acquisition of data from the crop and its environment. For this, sensors, cameras, visual observations and conventional samples to georeferenced are used. These data can be on the geometry of the crop, on the amount of biomass, on its vigor, on its state of health, on the characteristics of the soil, etc. Once the data is obtained, useful information must be extracted for the farmer and / or the technician. One of the information obtained is whether the crop is developing correctly and uniformly throughout the plot. This information will be used in the Decision-Making stage. This stage is where the agronomic management operations to be carried out and in what way are decided. Finally, it is

possible to act in the field in order to apply the necessary resources or carry out the necessary operations.

## Results and Discussion

The benefits of using PA in potato crops can be considerable in technical, ecological and economic aspects. The recognition and detailed evaluation of variables at specific sites make it possible to monitor and correct identified problems. This technology contributes to producing a more efficient and ecological agriculture. It allows you to save on plant protection products, fertilizers and reduce the amount of nitrogen used. This reduces costs and makes it possible to optimize agriculture, see figure 2. It reduces the environmental impact by optimizing the use of water, pesticides and machinery fuel; Thus, with fewer resources, greater production is obtained.

**Figure 2. Expected benefits with PA**



Source: Authors.

Making the most of the productive potential of soils is one of the advantages of applying this technology in agriculture. Farmers are more efficient thanks to the use of sensors because they only use the amount of inputs necessary for the production of crops. In addition to reducing the use of fertilizers, reducing the waste of resources and maximizing the yield capacity of the land lead to increased profitability by reducing economic risk in the decisions of farm owners. Another benefit of precision agriculture is the ability to achieve responsible water management, which is made

possible by variable leveling and irrigation systems that can be operated remotely and in real time by farmers using mobile devices.

### Conclusions and future work

There is a paradigm that the benefits of PA are only for large crops with large capital investments and expertise in information technology. It is necessary to break this paradigm, since currently there are techniques and different types of analysis and economic methods that are easy to apply and develop for any producer regardless of the number of hectares the land has, this aspect involves potato crops.

Potato crops are one of the main economic activities in Colombia, which is why they are vital for the country's agricultural development. In addition, information and communication technologies (ICT) have begun to be used and implemented throughout the life cycle of crops. Therefore, they are very important when defining a system based on PA that has the ability to increase crop yield and optimize the use of economic resources such as fertilizers, water and pesticides, among other functions.

We can conclude that this work provides an analysis of the AI technologies applied in PA for sustainable agronomy. PA is a useful insight about the ways of technical development in smart farming. This paper has a significant and useful contribution for emerging areas in PA research such as: To be Environmentally friendly, optimize rates of fertilizer, seed and chemicals for soil. To ensure the goal of sustainable agronomy, following future research areas are identified from this systematic review. Every day new technology is cheaper. New intelligent software platforms and advanced technologies like machine learning can further help in development of PA.

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## REGIONAL OPERATIONAL PROGRAM - INSTRUMENT FOR INVESTMENTS DEVELOPMENT - CENTRAL REGION, ROMANIA

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**Abstract:** Maximizing the absorption of structural funds and their efficiency have to be considered in the general framework of the legislation and the economic effects generated in the national economy. The analyse presented in the article shows the results of the absorption of European funds in the financial programming period 2007-2013 for Central Region, Romania. The analyse includes also an overview on the economic evolution of the companies in sustainability period, analyse extended until 2019. European funds continue to be the main factor supporting the modernization of the Romanian economy and the implementation of structural reforms.

The analyse conducted is focused on Regional Operational Program. This program recorded one of the highest absorption rates in the financial programming period 2007-2013, having in the same time, good perspectives for the current financial programming period as well. The monitoring and implementation reports at national and regional level highlight the general program indicators, initially established and carried out during the implementation period, respectively later during their sustainability period. However, these indicators are predefined and follow the impact analysis of the Regional Operational Program at macroeconomic level. There is no information collected on the economic performance of the beneficiaries of funds under this program. This analyse naturally integrates in the area of researches that seek to bring new values, perspectives and configurations to the topic of investigating the role of the impact of non-reimbursable funds on business development. As in any scientific approach, the first step in the elaboration of research is the positioning in the sphere of knowledge, both of the general area of research and of the specific fields. The article provides also the quantitative analysis that will represent the basis for the qualitative research, which will be included in a wider analyse.

Companies that used non-reimbursable funds to support their business development, generated additional working places, increased their turn over generated through the economic activity and improved their efficiency.

**Key words:** structural funds, economic performance, regional development strategies

**JEL Classification:** L15, P17

### Introduction

The pre- and post-accession experience required special attention to be paid to the process of attracting and absorbing European funds, pre-accession, and later structural and investment funds, respectively. The experience gained since Romania's integration into the European Union with full membership status, provides a broad basis on which informed and reasoned decisions can be taken in updating and adapting the national legislative framework accordingly to ensure the efficiency of absorbing European funds.

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Regional development, meaning social and economic development of regions in one country but also at European Union level, is a broad concept that includes economic growth and development, and also the social changes and evolution of the communities and society in general. The background for assuring the economic development at regional level is economic growth together with social development. The regional development is being defined as a process of desirable qualitative, quantitative and structural changes in the social, cultural, economic, and infrastructure areas, which are aiming to improve the living conditions of the region's population (Sekuła, 2002; Jezierska-Thöle, 2008).

Romania, starting with the decision of integrating into the European Union, has assumed a national development policy at regional level that aims convergence with Community objectives by implementing common policies and respecting principles and regulations. This objective aims to ensure a balanced socio-economic development at regional level leading towards reducing development gaps between countries and regions at European Union (Blom-Hansen, J., 2015; Caldas, P. et al., 2018).

Balanced development inside European Union is being implemented through community policies that support all Member States through specific funds and programs, which are adjusted to the characteristics of each Member State economy (Coppola, G. et al. 2020; Crescenzi, R. et al. 2020). Romanian economy's development objectives are established at national level through National Strategic Reference Framework. Regional development includes thematic priorities and aims to support the development of basic infrastructure at European standards in order to ensure the interconnectivity of the European space (Pîrvu, R. et al. 2018; Hagemann, C., 2019).

## **Literature review / Research Background**

Considering the economic structure, Romania has eight regions (level NUTS II). The Romanian development regions, were established based on geographic and socio-economic similarities, in order to develop coherent regional development strategies (Gavrila-Paven I., 2020). At regional level common policies and financial instruments have to ensure sustainable development, which reduces disparities between regions and can shape the development of the entire country (Wlazlak, K., 2010; Fedajev, A et al. 2019). Promoting and strengthening regional development is vital for shaping the proper conditions for the long-term development.

National investment strategies corroborated with the financial instruments which are supporting regional development have to be customized on the real needs at regional level and have to identify potential growth centres inside the regions that can support and stimulate future development. This framework can make possible to implement public tasks, especially investment project important which are proving that a long-term perspective is essential (Lewis B.D., 2011).

Regional business environment has to be encouraged and supported to increase its efficiency and competitiveness. Investment project can stimulate local development and diffuse its positive effects at regional level. But, considering from

the coordinating possibilities from national and regional level, these expenditures may also be limited in time due to the need of covering the current ones. The essence of investment project expenditures are their real results, meaning what these projects are developing and leaving behind (UN Organisation, 2015; Heathcote, C.; Mulheim, I., 2017). So, it is necessary to allocate funds and to use proper financial instruments for projects development as part of public spending plans.

In this framework present article is focused on the results obtained in implementing the Regional Operational Program in Romania, for Central Region.

## **Methodology**

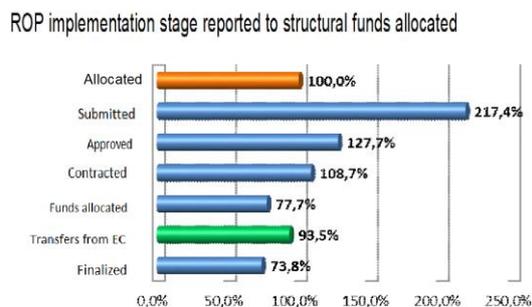
This study naturally integrates in the area of researchers who seek to bring new values, perspectives and configurations to the topic of investigating the role of the impact of non-reimbursable funds on business development. As in any scientific endeavour, the first step in the elaboration of research is the positioning in the sphere of knowledge, both of the general area of research and of the specific fields. Through the aspects approached, this paper belongs to the economic sciences and is part of the general area of research on the issue of sustainable development, namely the determination of the impact of the use of non-reimbursable funds on the development of enterprises. In this way, the research topic combines and even expands some elements specific to several fields of economic science, including: macroeconomics, microeconomics, management, economic and financial analysis, internal public audit, financial-accounting audit, statistics, regional development and integration European Union. The elaboration of the paper also requires a deep knowledge of national and international economic legislation in the field of management of European funds.

Overall, the scientific approach, the research methodology and perspectives will coherently combine qualitative research with quantitative research, descriptive-conceptual perspective, with empirical research. In the stage of documentation and systematization of the approaches from the specialized literature, numerous foreign and domestic specialized works, regulations and international financial reporting standards, monitoring reports made at regional and national level will be covered. The analysis of studies conducted by other researchers and the conclusions they have reached, will provide the opportunity to confirm or contradict their views and to form an overview of the issue, viewed from several points of view, precisely to eliminate subjectivism.

## **Results**

Regional Operational Program implemented for the 2007-2013 financial period had a final level of absorption of 93.5%. The investments supported through this program designated especially for the business environment continues to produce effects long after the implementation of this program. The aim of the study is to analyse these results and to observe future evolution of the business environment and to make recommendation for the present program available for 2014-2020 period

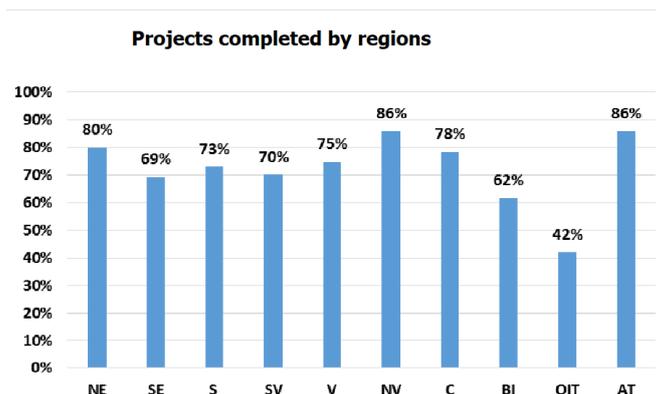
in order to contribute to the increase of the absorption level. The Community allocation (European Regional Development Fund) available for this program in the period 2007-2013 was 3,966,021,762 euros. At the end of implementing period the stage of implementation for Regional Operational Program was as follows:



***Figure 1. Regional Operational Program 2007 – 2013 implementation stage reported to structural funds allocated***

Source: Evaluation Report, Interventions Evaluation ROP 2007-2013, 2019.

Global results, at national level, by implementing the 4,491 projects there were created 24,994 jobs. During the implementing period, there were 10,056 financing applications submitted overall, which requested approximately 8.62 billion Euro contribution from the European Regional Development Fund. At the level of domains, the advance over the average of the program registered by the field of emergency equipment, micro-enterprises and social infrastructure is noticeable.



**Figure 2. Completed projects implemented from Regional Operational Program 2007 – 2013 by regions at March 15, 2017**

The small and medium enterprises sector remains a strategic sector for Romanian economy, including for the Central Region. The projects supported and implemented by the SMEs had the role of reducing the large differences in economic competitiveness compared to the European average in different sectors. The efforts are focused on increasing labour productivity supporting especially the investments in technology and production modernisation of the SMEs, actions that will contribute to the reducing of production costs. Also, this program represents an opportunity for SMEs to invest and support the innovation process in sectors with regional development potential. This potential has to be determined at regional level and the strategies should be designed considering these particularities. Regional Operational Program is promoting also the concept of circular economy and the involvement of SMEs in international research, development and innovation projects.

A particularly important objective of the analysis was to monitor the evolution of the survival rate of SMEs benefiting from financing instruments. The conclusion is that the resilience rate of newly created enterprises one year after the establishment is increasing from 63.4% in 2011 to 77.8% in 2015 and 68.9% in 2016, the last year with data available from the source EUROSTAT. The annual resilience rate is on an upward trend, but unsustainable in the longer term. The assessment is based on the annual volatility recorded by this indicator, respectively increases, followed by quite large decreases.

On this growth fund, instead characterized by volatility, the result indicator related to ROP, respectively the survival rate of micro-enterprises 3 years after the establishment to reach the target of 72.3% in 2023 has general favorable premises to achieve.

Both the evolution of the data from the statistical source and the assessments of the IB management factors and those responsible for monitoring and verifying the

investment projects within the IB contribute to the shaping of these favorable premises. Thus, it is estimated that the Regional Operational Program has significantly contributed to strengthening the market position of SMEs and also to the survival rate of these enterprises. An important qualitative indication of the importance of the ROP is that during this programming period SMEs from 2007-2013 applied again to obtain new funds to cover their new needs.

Moreover, according to the results of the ex-post monitoring of the state aid granted in the Regional Operational Program for the period 2007-2013, very few of the financed SMEs were suspended, dissolved, deregistered or went into insolvency. All interviewees expressed optimism regarding the fulfilment of this indicator by 2023, knowing the previous efforts and the degree of awareness of the financing beneficiaries for the preservation of the project results during the state aid monitoring period.

From the perspective of the beneficiaries of financing contracts, participants in the group discussions, this effect is one pursued by their strategy of continuing to access the different types of financing available. In addition, the characteristics of the sample from the survey carried out indicate that micro-enterprises and SMEs, in their vast majority, were more than 3 years old when they submitted the projects and concluded the financing contract. It is an additional guarantee that their life expectancy due to accessing financing and solving some of the needs of endowment and recovery of the technological gap will be extended far beyond the time interval of 3 years taken in defining the result indicator.

## **Discussion**

SMEs were considered first as a general sector that can be supported and stimulated through the allocation of Regional Operational Program. Still, although SMEs have been better integrated into the development and development of public policies, effective public policy instruments must consider the particularities of these entities. So, the instruments should be designed considering not only the size of SMEs, but also the full range of parameters that determines the nature of each SME (areas of activity, location, level of innovation) and the different phases of the life cycle of SMEs.

The good functioning of the partnership principle in the programming phase and, subsequently, in the implementation brought together in its composition representatives of all the interested parties, including of the other programs with which the Regional Operational Program is complementary. However, both the documentation carried out at the level of international practices and the field findings identified during the evaluation exercise show that there is still room for improvement in the implementation of the partnership principle during the program, as there is a risk that partner involvement was only a formalist exercise. Following these conclusions, the application of the partnership principle should be monitored during the implementation period.

Despite the simplifications made, the lack of proportionality of administrative requirements to the amount of funding obtained is maintained, as well as other administrative obstacles that prevent SMEs from seeking support through European Structural and Investment funds. Supporting the local capacities of business support structures (consultancy services sector, territorial information and guidance centres and agencies, incubators/accelerators etc.) to assist SMEs in the process of preparation and, subsequently, implementation of their projects investment.

Depending on the category to which they belong, SMEs have distinct needs. Therefore, it had to be considered to adapt the types of support according to these different needs. Thus, the conclusion is that the Regional Operational Program proposes financing solutions based on the distinct needs of SMEs (financial instruments, venture capital fund, business incubators/accelerators, as well as supporting SME initiatives, etc.). Equally, the Regional Operational Program is only one of the financial instruments for implementing public policies to support SME development and cannot come up with financing solutions for absolutely all the problems of all SMEs in all sectors of the Romanian economy, given the intrinsic restrictions of conditioning, but and available budget.

Access to finance needs to be supported and simplified, especially for SMEs and start-ups, such as improving the training scheme, events and disseminating funding opportunities as locally as possible. This must be coupled with strengthening complementarity and synergies between Structural Funds programs and other national and EU investment programs.

Following the implementation of the Regional Operational Program, the service of supporting the beneficiaries was developed, so necessary during the project submission period but also during the implementation period. The support of the applicants during the clarification period during the opening of the calls also existed in the previous programming period, but the operation of this service was not in a systematic manner. This explains why there is not yet a harmonized, uniform practice in all intermediate bodies. Hence the need to improve the operational procedure, training and introduction of a mechanism for exchanging experience and lessons learned in the communication relationship with SMEs and other categories of program beneficiaries.

## **Conclusion**

The elaboration of the 2021+ strategy for ESI funds will require a greater and more active involvement of the associative business environment of entrepreneurs' associations, employers' organizations at all levels as it was done during the Regional Operational Program preparation period or when the evolution of the growth approach concept competitiveness of SMEs required the resumption of consultations.

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# THE POTENTIAL OF NON-WOOD PULP IN EUROPEAN CIRCULAR BIOECONOMY

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**Abstract:** European Union is striving towards sustainability and circularity due to many serious reasons such as limited natural resources, climate change, degradation of ecosystems, biodiversity and lands etc. To address these challenges, the EU created in 2012 so called “European Bioeconomy Strategy” which aims towards innovative and sustainable use of renewable resources including the concept of circular bioeconomy and bio-based economy. Biomass and Bio-based products have great potential for production and recycling the raw materials including agricultural residues. The significant potential is in lignocellulose retrieved from agriculture and forestry residues involving waste, straws or other by-products.

**Purpose:** The aim of this research is to study and describe the potential of pulp from fibres other than wood in Europe.

**Design/methodology/approach:** The research is based on secondary data obtained from Faostat and various research studies. Data were analysed by using descriptive statistics.

**Findings:** Results showed that the world production of pulp from fibres other than wood has decreasing trends. In total only 11,8 mil. tonnes were produced worldwide in 2019. Approximately 82% of overall non-wood pulp is produced in Asia, where the largest producer is China. The similar trend can be observed in European union as well. The major producers are Czech Republic, Spain, Italy, France, Poland and Hungary. Slovakia produced in 2019 only 1 000 tonnes. Pulp from fibres other than wood offers a huge potential for papermaking industry in countries that have no or limited access to wood fibres. Non-wood fibres can be produced from cereal straws, grasses and from other agricultural residues. Furthermore, the production of non-wood pulp provides opportunities for food sectors as it can be used as raw material for degradable food packaging which will contribute to sustainable consumption. In addition, supporting the processing agricultural residues will indirectly foster bioeconomy in the rural areas.

**Research limitations:** The primary limitation to the generalization of these results is the character of this paper which includes only pilot study, therefore a further in-depth research should be addressed.

**Keywords:** circular bioeconomy, biomass, pulp, agricultural residues

## Introduction

According to European bioeconomy strategy, there exist five objective: ensuring food and nutrition security, managing natural resources sustainably, reducing dependence on non-renewable resources, mitigating and adapting to climate change and strengthening European competitiveness and creating jobs. Moreover, it contains 14 concrete actions including the deploying bioeconomies at local level across the whole of Europe by creating agenda for sustainable farming and food

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systems, biobased products and forestry (European Commission, 2019). Bioeconomy offers great opportunities for paper and pulp sector in the European Union including new concept for business with wood and non-wood fibres, novel materials, bio-based products, chemicals or fuels (European Commission, 2021).

## Literature review / Research Background

Paper and pulp industries play an important role in bio-energy production in many European countries. Currently, these industries use wood and recovered (recycled) paper as the main source of pulp (Gavrilescu et al., 2008). There are a number of non-wood raw materials on the market for the production of paper pulp as well as a number of chemical processes for its production (Leponiemi, 2008). According to Fernández-Rodríguez et al. (2017) there are three categories of non-wood fibres used in pulp production. The availability of these non-wood raw materials represents an opportunity to reduce wood consumption in the paper industry. Alternative sources of pulp for paper production include raw materials from special-purpose crops (jute, hemp, flax), agricultural residues (cereal straw, rice straw, corn and rapeseed stalks) or naturally uncultivated plants such as various grasses and cane (Kamoga et al., 2016 ; Gomez - Sanchez et al., 2017).

According to Liu et al., (2018) non-wood fibres can be produced from cereal straws, grasses and from other agricultural residues:

- Gramineous fibre materials  
bamboo, bagasse, rice straw, wheat straw, sorghum residue, corn straw, reed,
- Bast fibre materials  
mulberry, tan skin, cotton stalk bark, kenaf, jute, hemp, flax
- Seed hull fibre materials  
cotton and cotton linters
- Leaf fibre materials  
banana leaves, sisal, abaca, sugarcane leaves

Non-wood plant raw materials that have been tested so far for pulp production include the following crops: cereal straw, rice straw, sugar cane bagasse, bamboo, cane, esparto, kenaf, corn stalks, sorghum stalks, rape, sunflower. In general, these raw materials are used to produce shorter fibres as a substitute for hardwood pulp. Non-wood plant resources such as cotton, flax, hemp are used to make longer fibers that are substitutes for softwood pulp (Hurter, 2001). Fibres of Jute plant are characterised by high content of cellulose (Abd El-Sayed et al. 2020). The production of paper from non-wood fibres has a lower impact on the environment. Firstly, it is the use of agricultural residues itself, thus preventing their combustion, which pollutes the air. Secondly, the process of pulping the non-wood materials itself generates satisfactory results using sulphur-free methods. Furthermore, the processing requires less energy for most non-wood fibres, which can lead to energy savings (Stoica et al., 2010). The use of non-wood fibres resources for pulp production has several economic and environmental aspects, such as faster growth compared to wood, continuous cultivation in the case of wild plants or availability

in larger quantities at agricultural residues of some major crops (Huang et al., 2008; Hedjazi et al., 2009; Sanchez et al., 2010). In addition, it is expected that the demand for pulp from non-woody biomass will increase in the industrialized countries of Europe and North America. The main reason is environmental aspects such as the depletion of forest resources and the ecologically burdensome disposal of agricultural residues (Bajpai, 2018).

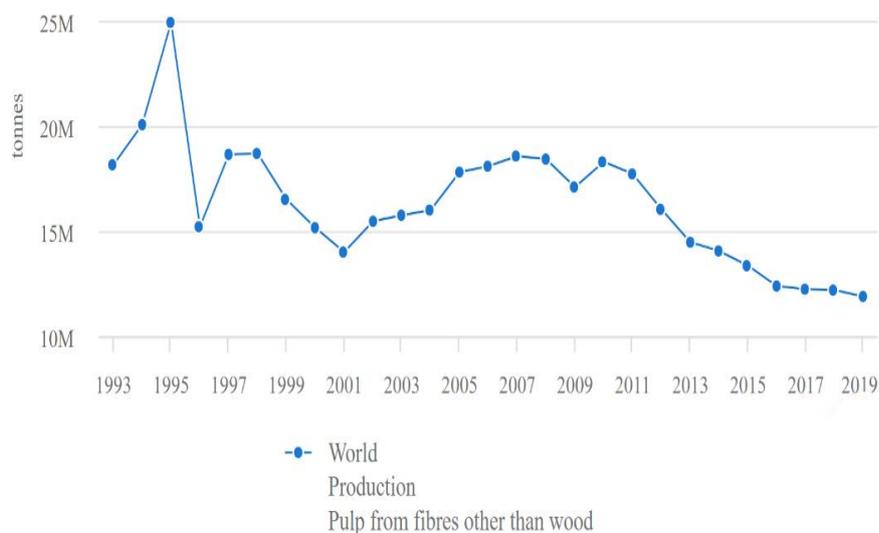
## Methodology

The paper is based on desk research focused on various studies and reviews oriented on pulp produced from fibres other than wood and non-wood pulp.

Secondary data were obtained from Faostat in order to analyze the current situation in the market with pulp from fibres other than wood. The analysis was conducted by applying descriptive statistics.

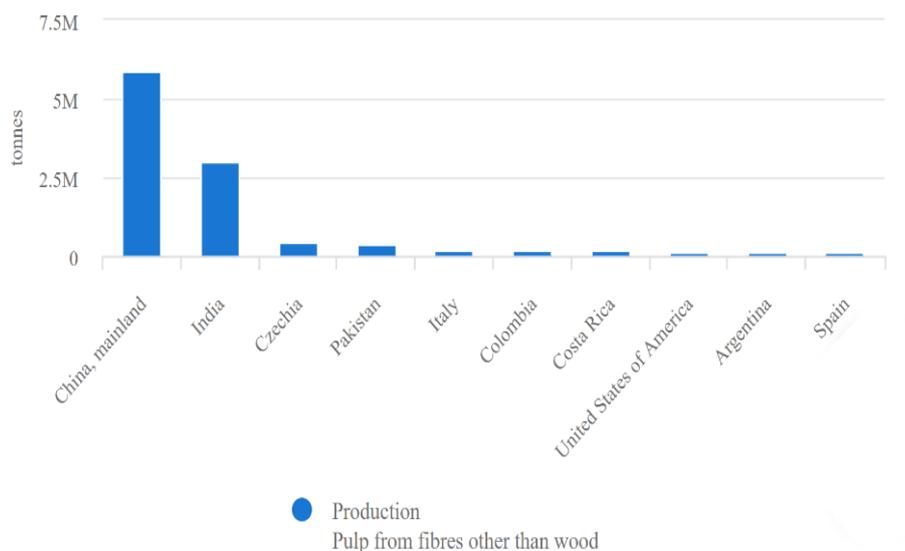
## Results and discussion

According to Figure 1, the world production of pulp from fibres other than wood had increasing tendency from 2001 till 2007. Since then it has been decreasing. In 2019 the total production reached 11,8 million tonnes. The majority of pulp from non-wood fibres was produced in Asia (82.8%), followed by Europe (9.2%) and America (6.5%). The main producer in 2019 was China generating approximately 5,88 million tonnes followed by India with 3 million tonnes (Figure 2).



**Figure 1. World production of pulp from fibres other than woods for years 1993 - 2019**

Source: Faostat, 2021



**Figure 2. Top 10 countries in production of pulp from fibres other than wood in 2019**

Source: Faostat, 2021

The pulp from fibres other than wood was produced in 2019 only by few member states of European union. Table 1 shows that the major producer was Czech Republic with 441 278 tonnes followed by Italy, Spain, France, Poland, Hungary, United Kingdom of Great Britain and Northern Ireland, Belgium and Slovakia. European union produced in 2019 around 996 200 tonnes.

**Table 1. Production of pulp from fibres other than wood in 2019 within EU**

Czech Republic	441 278 t
Italy	202 890 t
Spain	122 000 t
France	81 000 t
Germany	73 242 t
Poland	51 000 t
Hungary	15 000 t
United Kingdom of Great Britain and Northern Ireland	7 000 t
Belgium	1 790 t
Slovakia	1 000 t

Source: Faostat, 2021

The production of pulp from fibres other than wood have many advantages such as worldwide surplus of non-wood materials including agricultural residues, shorter cycle growth of these fibres, huge potential in paper industry as these fibres have

special papermaking properties (low content of lignin), pulping process is shorten. Pulp from fibres other than wood may reduce the deforestation process as it represents an alternative for both softwood and hardwood fibres. In addition, if it is used with wood fibres and recycled pulp, the wood resources can be stretched (Abd El-Sayed et al. 2020, Singh et al. 2010). The huge potential is seen in using these fibres and pulp for biocomposites in textile or automotive industry (Mutia & Risdianto, 2017). Moreover, pulp made of fibres other than wood may be use in food industry as a biodegradable products or biodegradable food packaging as a substitute to plastic (Sharma, 2021).

Despite great potential of non-wood fibres, there exist several problems related to seasonal availability of raw materials at local level, high transportation and storage costs, small-scale mills, low chemical recovery system and environmental drawbacks due to e loss of pulping chemicals (Abd El-Sayed et al. 2020; Gominho et al. 2018; Naqvi et al. 2018).

## Conclusion

Pulp from fibres other than wood is produced mainly in China and India. The main producer in European Union is Czech Republic and Italy. Currently, the world production has decreasing tendency. Desk research showed a great potential of pulp from non-wood fibres in bioeconomy especially in paper industry as well as in food industry as a suitable material used in production of biodegradable food products and packaging. The paper represents a pilot study, therefore further in-depth research should be conducted.

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## **Section 5:**

### **Tourism Management**

# COVID-19 Pandemic and Economic Sustainability of Tourism and Hospitality: The Impacts on SMEs in the Czech Republic

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## Abstract:

**Purpose:** COVID-19 pandemic has brought a lot of changes in socio-economic environment as well as the business environment. The hospitality and tourism industry suffers enormously from the COVID-19 pandemic and government restrictions in all countries. The behaviour of the whole tourism system in post-COVID-19 period is still unclear and the economic sustainability of the tourism sector is put at risk, not only due to the outflow of human resources from the industry. The tourism and hospitality service providers face to the biggest crisis of the industry in last decades. This paper focuses the impacts of the pandemic on small and medium enterprises (SMEs) and compare their crisis behaviour in several segments, such as accommodation services, catering services, and tour operators (TO) / travel agents (TA) in the Czech Republic.

**Design/methodology/approach:** A quantitative survey was carried out from May to September 2020 and the sample consists of 208 valid responses, especially from SMEs owners and managers.

**Findings:** The results show how the enterprises in different segments reacted on the crisis, which measures they implemented in the first six months of the pandemic and what they planned to do in marketing, HR, and financial management.

**Research limitations:** Results are focused only on the hospitality businesses and tour operators and travel agents. There are only limited research sample covered in our research. Results are not general for all businesses in tourism industry.

**Key words:** COVID-19, Tourism, Hospitality, SME, Czech Republic

## Introduction

The COVID-19 pandemic influenced economics of all countries in the world. It also affected many industries of world economics. From the first information about COVID-19, there were many articles and scientific work published. Many of them were focused on the tourism field. COVID-19 pandemic was a new international problem on which we were not prepared. Zenker & Kock (2020) describe six different crisis and they recommend reaching the best practice from crisis. This crisis is connected not only with healthy issues, but there are many more thinks to handle for business and people in affected economies. This paper focuses the impacts of the pandemic on small and medium enterprises (SMEs) and compare their crisis behaviour in several segments, such as accommodation services, catering services, and tour operators (TO) / travel agents (TA) in the Czech Republic. The results show

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how the enterprises in different segments reacted on the crisis, which help they expected and what they planned to do in marketing in the first six months of the.

### **Literature review**

COVID-19 pandemic affected many fields of economy. Donthu and Gustafsson (2020) discussed a global problem of COVID-19 pandemic on a society and also on a tourism industry. Loose of incomes for businesses and employees, reduction of jobs, movement restrictions – all these have to be handled by businesses in a very short time. Governments flexibly reacted and brought many funds and actions for support of national economic activity. Williams and Kayaoglu (2020) monitored the support connected to help against covid crisis focused on differences between businesses included and excluded in these programmes.

COVID-19 pandemic changes also customer behaviour. Fear about health and life changed shopping behaviour and decision-making process (Eger et al., 2020). Customer behaviour and its changes on Korean tourism market was the main research topic of Sung et al. (2021). Consumer behaviour on Slovak market was discussed, for instance, by Csikosová et al. (2019).

Pappas and Glyptou (2021) describe situation with customer behaviour in hotel industry in Greece. Their study generates four possible solutions in the field of health, safety, and quality. The results are based on the customer perception in hotel industry. Similar topic is researched by Ming and Mai (2021) or Pavlatos et al. (2021). Strategies of tourism providers were also changed as customers' preferences. According to study of Heredia-Colaco and Rodrigues (2021), there is more attention paid to safety and hygiene. Their study was conducted from May to June 2020 in hotels around the world. More respondents believe in recovery of tourism in 2021 – in the same proportion of income as income of 2019. One of the most important topics in tourism research in this era is the motivation of customer to travel. Some researchers deal with hygiene and disinfection of hotel space as a tool for motivation to book hotel and stimulate the feeling of safety (Jimenez-Barreto et al., 2021; Pillai et al., 2021). Pillai et al. (2021) researched impacts of previous global crisis and response rate of accommodation and catering providers. Smart et al. (2021) bring one specific case focused on reaction of two hotels on COVID-19 pandemic. Some hotels decided to provide accommodation for paramedics for free as a CSR activity. However, Sin et al. (2021) verified the negative impact of free accommodation for paramedics on market value of hotels. They discussed that those activities belong to corporate social responsibility (CSR) but it impacts negatively on shopping customer behaviour. It relates to perceived safety risks. Navrátilová et al. (2020) deal with safety and customer behaviour in segment of Czech tourists aged 19 - 29. They analysed data about preferences in decision-making process in destination choice. Decision-making process in accommodation in Visegrad region evaluate Bacik et al. (2020). They used web page TripAdvisor and 22 400 reviews to analyse. Khan (2021) analysed the impact of restrictions on one hotel. This hotel was very flexible in reaction to the situation and it had very positive impact on its prosperity. It used contactless payments, contactless check-in/out and entrance to hotel room from

parking without go through hotel lobby and reception. Generally, digitalization of services in tourism represents a trend and a possible way for future travelling, as well as changes in behaviour of digital tourist (Duffus and Briley, 2021).

Based on the literature review and the current status of the tourism industry in the Czech Republic, we postulated following hypotheses:

H01: Statistically significant difference between marketing activities of TO&TA and other subjects of tourism DOESN'T EXIST.

Ha1: Statistically significant difference between marketing activities of TO&TA and other subjects of tourism DOES EXIST.

H02: Statistically significant difference between expected help of TO&TA and other subjects of tourism DOESN'T EXIST

Ha2: Statistically significant difference between expected help of TO&TA and other subjects of tourism DOES EXIST.

## Methodology

The main method of this research was a quantitative survey. For this purpose, we developed questionnaire with standardized tool. Data collection period was from May 2020 till October 2020. Potential respondents were addressing by e-mail from Albertina Database (accommodation and catering facilities, guides, tour operators/travel agents, culture facilities, tourist attractions, transport). In total, we addressed 23 683 businesses per e-mail. Sample of our research is 208 valid responses (response rate: 0,9 %). For purpose of this paper there have been chosen only the accommodation services, catering services and tour operators/travel agencies (184 responses), which fulfil the criteria of SMEs. We also worked with a combination of these categories, e.g. accommodation + catering, travel agent + accommodation etc. To analyse the data, we used ANOVA test and Post-hoc test (Tuckey-Kramer test).

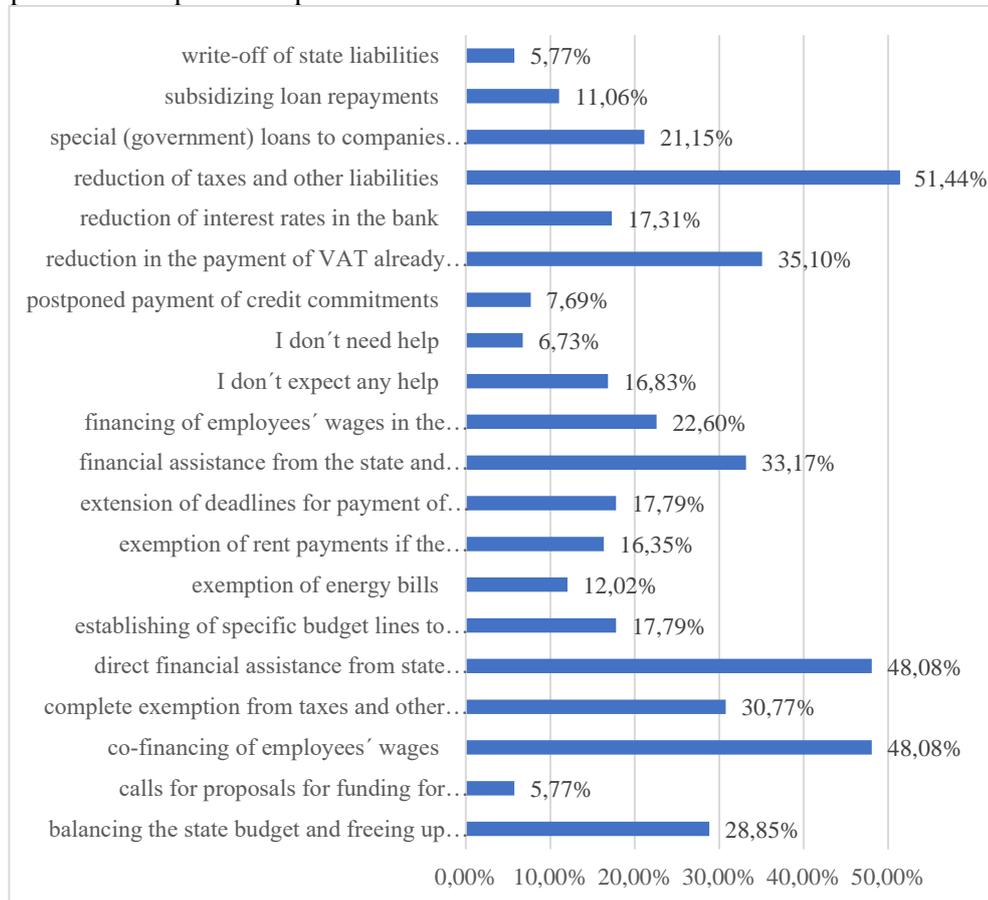
We focused only of few questions from the survey in this paper. First one is about planned marketing activities connected with covid-19 pandemic. Second question is which help businesses expected. Both questions were semi-closed with the option of own answer. But respondents used prepared answers. We used five point Likert scale of agreement for first question and dichotomy answers yes/no for the second question.

## Results

To evaluate the hypotheses, we focused on marketing activities and expected help of tourism businesses (accommodation facilities, catering facilities, tour operators and travel agents) with the aim to specify the differences in needs and reactions between accommodation and catering services, on one hand, and tour operators/travel agents, on the other hand.

### ***Expected help***

Tourism businesses expected most reduction of taxes and other liabilities, direct financial assistance from state institutions, and co-financing of employees' wages. Only 6,73 % of businesses do not need any help. Figure 1 summarizes the proportions of expected help for the SMEs.



***Figure 1. Expected help***

Source: Own elaboration, 2021

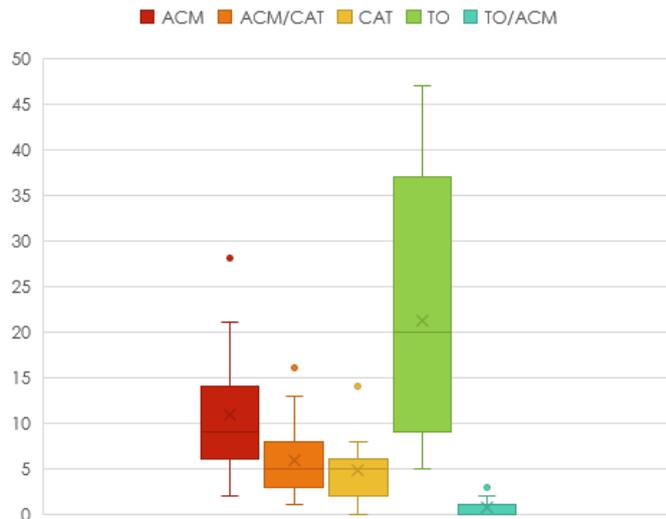
We conducted ANOVA test and Post-hoc test to find differences between the groups of businesses. The results of the analysis is resented in Table 1. We can identify the differences between travel agency/tour operators and other businesses. The impact of COVID-19 pandemic on travel agencies/tour operators was enormous and the travel restrictions were fatal to many SMEs in this segment. Therefore, it can be the reason why we identified differences in expected help between travel agencies /touroperators and accommodation and catering businesses because they had a chance to substitute partially common guests with other operations (take-a-ways, business trips etc.).

**Table 1. Results of Post-hoc test for expectation help**

		Difference	n(gr1)	n(gr2)	SE	q	critierium	
ACM	ACM/CAT	5,052632	19	19	1,688572568	2,99225	3,947	non
ACM/CAT	CAT	1,052632	19	19	1,688572568	0,623385	3,947	non
CAT	TO	16,36842	19	19	1,688572568	9,693644	3,947	difference
TO	TO/ACM	20,42105	19	19	1,688572568	12,09368	3,947	difference
TO/ACM	ACM	10,15789	19	19	1,688572568	6,01567	3,947	difference
ACM	CAT	6,105263	19	19	1,688572568	3,615636	3,947	non
ACM/CAT	TO	15,31579	19	19	1,688572568	9,070258	3,947	difference
CAT	TO/ACM	4,052632	19	19	1,688572568	2,400034	3,947	non
TO	ACM	10,26316	19	19	1,688572568	6,078008	3,947	difference
TO/ACM	ACM/CAT	5,105263	19	19	1,688572568	3,023419	3,947	non

Note: ACM – accommodation, ACM/CAT – accommodation + catering, CAT – catering,  
 TO – Travel operators, TO/ACM – Travel operator + accommodation  
 Source: Own elaboration, 2021

Figure 2 shows the results in box-plot diagrams. There is a statistically significant difference between tour operator/travel agency and the other business groups. Travel operators in combination with accommodation answer also different then accommodation and catering businesses, as provided in Figure 2.



**Figure 2. Differences between groups – expected help**

Source: Own elaboration, 2021

### **Marketing activities**

We also identified planned marketing activities. The respondents expressed their agreement or disagreement on the Likert scale with following statements:

- 1) We will provide and support special offers and price reductions for our products and services.
- 2) We will intensify marketing and advertising campaigns.
- 3) We will increase the marketing budget.
- 4) We want to keep up with the competition and take advantage of every opportunity that arises.
- 5) We will focus on current (pre-crisis) guest segments, their preferences and expectations.
- 6) We will target new marketing segments (e.g. domestic clients).
- 7) We will use electronic marketing and distribution channels (reservation portals, etc.).
- 8) Compared to the competition, we will define ourselves with an original solution, a unique offer.
- 9) We will focus on loyal customers during the crisis.
- 10) We will switch to new technologies, especially in the area of communication with the client.
- 11) We will increase the quality of our products or services.

To test differences between the defined groups of SMEs, we used ANOVA and Post-hoc test of simple average of responses. Based on Table 2, we can argue that there are statistical differences among the groups of businesses. Only businesses

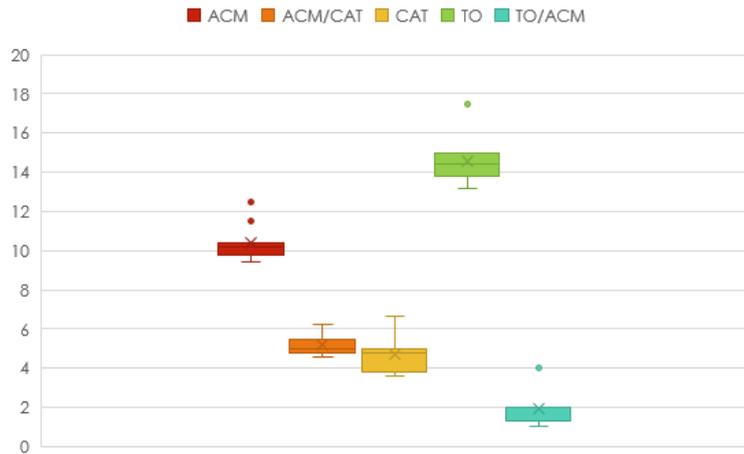
providing pure accommodation on one hand and the combination accommodation and catering services on the other hand, answered similarly. Analogously, businesses providing catering services on one hand, and the combination of accommodation and catering services on the other hand, answered similarly as well.

**Table 2. Result of post-hoc test – marketing activities of businesses**

		Difference	n(gr1)	n(gr2)	SE	q	criterium	
ACM	ACM/CAT	5,15	11	11	0,2659	19,36817	4,777	non
ACM/CAT	CAT	0,475758	11	11	0,2659	1,789235	4,777	non
CAT	TO	9,798485	11	11	0,2659	36,85026	4,777	difference
TO	TO/ACM	12,61212	11	11	0,2659	47,43182	4,777	difference
TO/ACM	ACM	8,439394	11	11	0,2659	31,73898	4,777	difference
ACM	CAT	5,625758	11	11	0,2659	21,15742	4,777	difference
ACM/CAT	TO	9,322727	11	11	0,2659	35,06103	4,777	difference
CAT	TO/ACM	2,813636	11	11	0,2659	10,58156	4,777	difference
TO	ACM	4,172727	11	11	0,2659	15,69284	4,777	difference
TO/ACM	ACM/CAT	3,289394	11	11	0,2659	12,37079	4,777	difference

Source: Own elaboration, 2021

Figure 3 shows the box-plot diagrams for four groups of businesses we analysed. This diagram was developed with the input of simple average of responses. We found differences between almost all groups.



**Figure 3. Differences between groups – marketing activities**

Source: Own elaboration, 2021

More detailed results are shown in Figure 4. Businesses wanted to keep up with the competition and to take advantage of every opportunity that arises. The loyal customer was the key factor of success. Most businesses do not increase their marketing budget and special offer and price reductions for product or services was not so preferred marketing activity. Overall results are shown in Table 4.

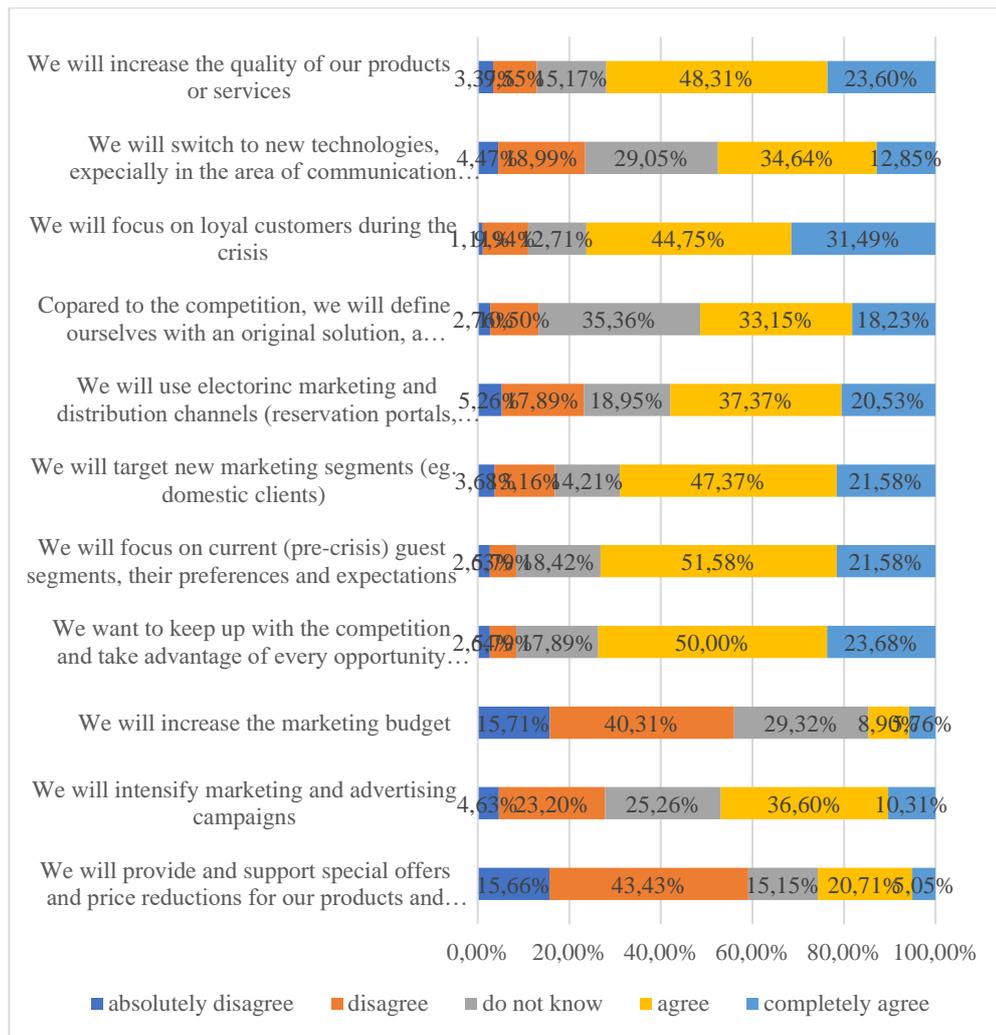


Figure 4. Marketing

Source: Own elaboration, 2021

### Conclusion

This paper focused the impacts of the pandemic on SMEs and compare their crisis behaviour in several segments, such as accommodation services, catering services, and tour operators/travel agents in the Czech Republic. The results show that in expected help there are not so big differences between catering and accommodation businesses. They could provide limited services during the lockdowns. However, we can find significantly significant differences between tour operators/travel agents and accommodation/catering service providers. They were very limited during the pandemic, therefore, they required much more help than the others. We can confirm

the first alternative hypothesis that the statistically significant difference between expected help of tour operators/travel agents and other tourism SMEs exist. Moreover, we can confirm the second alternative hypothesis that there is the statistically significant difference between marketing activities of tour operators/travel agents and other tourism SMEs.

Indisputably, a critically reduced number of international tourists had positive impacts on the environment. However, the economic and social pillars of tourism sustainability suffer from the COVID-19 pandemic and other restrictions can burn the travel and tourism industry to the ashes. The international travelling should be re-opened and stimulated quickly to achieve balance of the triple bottom line of tourism sustainability.

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# FACTORS TO ENHANCE ECOTOURIST'S ECOTOURISM LOYALTY, MODERATING EFFECT OF SOCIAL INFLUENCE AND PSYCHOLOGICAL OWNERSHIP

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## Abstract

**Purpose:** This study aims to provide novel insights via a joint investigation of the moderating effect of social influence and psychological ownership on ecotourism loyalty. It further explores and makes significant contributions to the Expectation Confirmation Theory.

**Design/methodology/approach:** Using longitudinal survey data gathered from 156 respondents before and after their travels, this research assesses the moderating role of social influence and psychological ownership on two of the well-established relationships in ecotourism loyalty.

**Findings:** Results show that social influence and psychological ownership have a strong moderation effect on the relationship between ecotourism satisfaction and ecotourism loyalty.

**Practical implications:** This study has two specific practitioner contributions. First, the study findings emphasize the importance of expectation management from the perspective of expectation management. Managers should exercise caution when providing false information about the location. There are dangers in setting unrealistic expectations for both travel planning and tourism management. Social media is regarded as a powerful 'word-of-mouth' source that can be used to exert negative influence from dissatisfied customers. As a result, proper social media management is critical. Second, researchers point out that vacationers' cognitive-affective connection to a destination is critical, along with the intangibles mentioned earlier, as a sense of ownership, ambiance, and perception of the image of the place they have of the destination. When people want to identify with a destination, they feel ownership of it. The brand strategy needs to be embedded in the destination strategy to target different target tourism identity parameters, like image, style, and values. A destination's connectivity to people's values can be generated if the destination is viewed as a place that people identify with rather than a transient location.

**Keywords:** social influence, psychological ownership, ecotourism loyalty

**JEL Classification:** M31, Z32

## Introduction

Ecotourism has become a vital activity in the lives of people who like engaging in adventures. Various factors affect ecotourism. Firstly, tourism loyalty involves psychological attachment between the tourists and their preferred destination (Oppermann, 2000). This form of psychological commitment is usually developed when the tourists leave the tourist destination with a positive experience. Various factors determine whether the tourist's experience is bad or good. Tourists' experience is a broad field that ranges from their host's behavior and other interactive features of their destination. Most of the experience of tourists is determined by four

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aspects: entertainment, education, escapist, and aesthetic (Ali et al., 2014). Entertainment is mainly the ability of their destination to entertain the tourist. It involves how their hosts treated them and how the destination features fulfilled their emotional appeal.

Secondly, psychological ownership is a form of attraction that creates a sense of ownership in the tourist with the features of the destination (Kumar & Nayak, 2019). When tourists develop such a form of psychological possession of the features of the destination, they will create a positive attitude towards such features. Psychological ownership for particular features and destinations develops when these features and destinations possess characteristics that conform to the preferences of the tourists. Different tourists have different priorities that they consider when choosing a tourist destination. When the chosen destinations meet the likes of the tourists, they feel connected to such destinations because they will enjoy the scenery and have a positive attitude towards such areas, thus having a positive experience which is a crucial component in the development of psychological ownership.

Lastly, social influence involves shaping the way tourists believe and view a particular destination (Turner, 1991). Various factors determine the perception of people toward a specific destination and its features. Some of these factors include culture, nationality, family, and relatives, among other factors (Brayley et al., 1990). With the emergence of social media, most social influence nowadays tends to come from digital platforms such as Facebook and other social media sites (Bizirgianni & Dionysopoulou, 2013). Social media has enabled people to view different features and destinations of different places before their visit. These sites act as advertisement platforms that tend to market the features of their respective destinations to attract people to such places. Most of the adverts are usually based on the quality of hospitality of the area because they understand that most tourists tend to judge a specific destination by the quality of their services. This research investigates the factors that affect ecotourism loyalty, moderating social influence, and psychological ownership in the tourism industry.

## **Literature review**

Destination image remains a critical aspect in marketing a tourist destination (Echtner, & Ritchie, 1991). For a tourist destination to attract a significant number of tourists, it must have a positive image. There are various ways that a destination acquires its image. One of the main ways is by fulfilling the expectations of the tourists (Santos, 1998). Before visiting a particular destination, most tourists usually conduct pre-visit research. This research is essential in informing the tourists of the kind of features they expect to find at the tourist attraction (Frías et al., 2012). There are several ways the tourist employs to acquire information about a specific place (de la Hoz-Correa & Muñoz-Leiva, 2019). One of the main ways of obtaining information about a particular destination is through social media (Narangajavana et al., 2017). Social media platforms have various features that enable people to connect with friends with people they have never met physically (Lange-Faria & Elliot 2012). For instance, Facebook has a section for friends to allow users to find friends from

other parts of the world and connect with them. Through these friends, people can make features that appear to be appealing to the tourist to create expectations within the tourist.

The experience tourists get from their trip to a particular destination is determined by various factors that apply during the entire trip (Cutler & Carmichael, 2010). Some of these factors include the hospitality that these tourists are treated to within their destinations (Graefe & Vaske, 1987). Hospitality includes accommodation, social involvement in the events taking place in their destination, other aspects such as culture and infrastructure of the destination, which play an important role in determining the kind of experience tourists get from their destination (Pizam & Reichel, 1978). When these features conform to the expectations of the tourists, they will have to create a positive experience. Experience is a psychological aspect that is fulfilled when the tourists emotionally connect themselves with the events they engage in (Larsen, 2007). Such connections generate memories that make up the positive experience. When a tourist gets a positive experience, they develop a positive destination image of their destination. This comes from fulfilling their expectations and their satisfaction from the events they engage in their trip (Larsen, 2006). Tourists tend to record their experiences throughout their trips. They use such recordings as a reminder of the memories they made in a particular destination.

Satisfaction can be defined as the ability of service providers to meet the expectations and the needs of their customers. A product or service also can meet the needs and the expectations that the customers have towards that particular product or service. This is the same case with the tourism industry. Various reasons make tourists visit a particular destination. These reasons create expectations such that when tourists visit a particular destination, they have expectations that such destinations should meet. When their expectations are met through the experience they get from their trips, and they get satisfied (Neal & Gursoy, 2008). A positive image of a particular destination plays a more significant role in meeting the tourist's expectations. This case enables tourists to get satisfied with the kind of treatment that they get from such destinations.

In the service sector, customer loyalty is vital. The services customers get from the service provider play an essential role in determining whether the customer will revisit the service provider. Customer loyalty is generated from the positive experience that the customers get from the service provider. This is the same case with the tourism industry. The kind of experience that the tourists develop from their various destinations determines whether they will revisit the same destination in the future or they will recommend it to other tourists. Positive experiences tend to create positive memories that connect the tourists to their various destinations. Loyalty can be defined as a deeply held commitment to re-purchase or re-patronize preferred goods or services consistently in the future, which results in repeated sales of the brand or the same brand set buying despite, despite situational influences and marketing efforts that have the potential of causing customers to change behavior (Oliver, 1999).

Facebook and other sites have enabled people to share pictures and videos of various destinations and their features. They can also share their experiences about

various destinations and the relevant information essential in helping potential tourists identify the different destinations that conform to their preferences. Social influence is also determined by interactions with family members and relatives who have had experience with a particular destination. According to psychologists, social influence interactions with people who have close ties with each other tend to influence their beliefs and their emotions concerning a specific object. People tend to think in the same direction as those people they spend time with. In this case, the opinion of family members plays an essential role in influencing the thoughts of a potential tourist towards a particular destination.

Psychological ownership is a feeling of possessiveness towards a particular object, place, organization, or person they do not legally own. Several factors determine psychological ownership. Some of them include the experience that individual shares with the particular object and the satisfaction that the consumers of a particular product get from using a particular product or service. In tourism, psychological ownership is portrayed when tourists develop a sense of ownership towards a particular tourist destination. This feeling of possessiveness is influenced by the features that tourist tourists find in their various destinations. Tourists have various preferences that they tend to look for when looking for a destination for their trip. When they find a tourist destination that matches their preferences, they tend to develop ownership of such places. A positive destination image creates expectations that the tourist looks forward to fulfilling the destination's expectations. Such expectations are generated because the destination image contains features that meet the tourists' preferences.

H1: Tourist expectation has a positive effect on destination image.

H2: Ecotourist experience has a positive effect on destination image.

H3: Destination image has a positive effect on ecotourism satisfaction.

H4: Destination image has a positive effect on ecotourism loyalty.

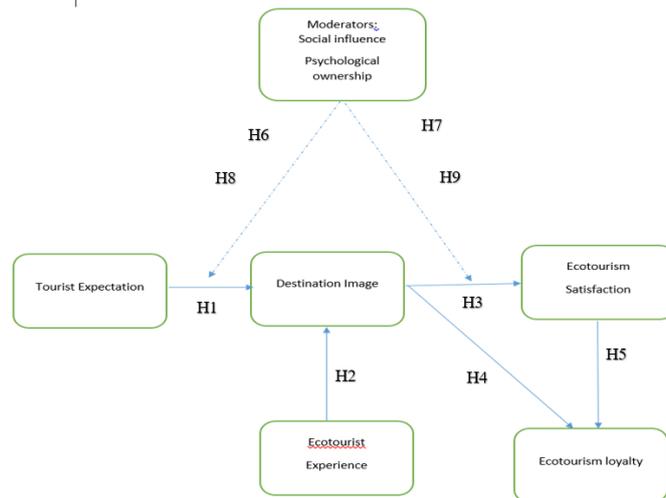
H5: Ecotourism satisfaction has a positive effect on ecotourism loyalty.

H6: Social influence moderates the effect between tourist expectation and destination image.

H7: Social influence moderates the effect between destination image and ecotourism satisfaction.

H8: Psychological ownership moderates the effect between tourist expectation and destination image.

H9: Psychological ownership moderate the effect between destination image and ecotourism satisfaction.



**Figure 1. Conceptual framework**

Source: own research

## Methodology

The participants were a mixture of both locals and foreigners who mainly were adults. Gender equality was considered with an equal number of people belonging to each gender. The subgroups also consisted of an equal number of men and women. During the research, each group had to choose its own destination. All the participants were non-locals, so that the research can be fully considered to be ecotourism research.

The primary method of data collection in used in the survey was longitudinal method. This method involves observing a certain trend under research for a period to establish the connection between the variables. The research took at approximately one month and involved tourists who were both familiar and unfamiliar with their respective destinations. Those who were familiar with the tourist destination were primarily under the psychological ownership segment while those who were unfamiliar with the destination were under the social influence segment. The management of the destination designed social media posts about their tourist center and posted them on different platforms. The posts were designed in a more attractive form than the most of the other posts featuring the best sceneries and other points of attraction. The participants were then exposed to the different posts of various destinations. Data was then recorded according to the kind of posts that were chosen as the preferred destinations. There are those who chose their destinations because they were there before, and they liked the experience and such destinations had features that they felt connected emotionally. On the other hand, there are those who chose their destinations for the time, and they were influenced by the beautiful sceneries and the positive image of the destinations as presented in

the posts and from the comments that they had received from the social media users who had been to such destinations before. Lastly, those who belonged to the psychological ownership were familiar with specific features such as islands, beaches, waterfronts, and other natural elements. Dividing segments into such categories was crucial in ensuring that the correct data was collected remains within the context of the research topic.

## Results

The theoretical model was analyzed through partial least square methodology drawn upon structural equation modeling via the SMART-PLS software. The authors decided to deploy PLS-SEM over other co-variance-based data modeling techniques was attributed to the small sample size and the non-normality of data (Goodhue, Lewis and Thompson, 2012; Hair et al., 2017). PLS-SEM offers an explanation of causal relationships among multiple variables without strict assumptions and pre-conditions (Hair et al., 2017), which makes PLS-SEM the inferential tool of choice. The composite reliability (CR) and average variance extracted (AVE) were tested for convergent validity of the model, especially CR and AVE values had to exceed the recommended value of 0.7 and 0.5, respectively, which can indicate the latent constructs (Hair et al., 2013). Tables 1 shows the high value of all item loadings from above 0.7. Therefore, the valid values for CR and AVE were retained significantly.

*Table 1: Construct reliability and validity*

Variables	Items	Factor loadings	Cronbach's Alpha	AVE	CR	rho_A
TE	TE1	0.797	0.718	0.637	0.841	0.721
	TE2	0.792				
	TE3	0.806				
DI	DI1	0.883	0.858	0.699	0.903	0.878
	DI2	0.786				
	DI3	0.84				
	DI4	0.832				
ES	ES1	0.997	0.995	0.989	0.996	0.996
	ES2	0.997				
	ES3	0.991				
EE	EE1	0.891	0.867	0.718	0.91	0.872
	EE2	0.904				
	EE3	0.834				
	EE4	0.75				
EL	EL1	0.942	0.945	0.857	0.96	0.953

Variables	Items	Factor loadings	Cronbach's Alpha	AVE	CR	rho_A
	EL2	0.939				
	EL3	0.915				
SI	SI1	0.942	0.935	0.757	0.86	0.923
	SI2	0.939				
	SI3	0.915				
PO	PO1	0.821	0.837	0.728	0.791	0.787
	PO2	0.914				
	PO3	0.925				

### Discussion and implication

The results suggested that social media plays a major role in influencing the potential tourists to choose the kind of destination that they want. Social influence also comes from other social media users who give various comments about a particular destination according to the kind of experience that they had with that particular destination. Tourists choose their destinations according to the destination image. A positive destination image leads to the creation of expectations. Those who responded to the questions about destination image said that positive destination image led to creating expectations that would make them aware of the kind of experience they would expect in their respective destinations (Picazo & Moreno-Gil, 2019). When these expectations are met, they lead to positive experience. A positive experience leads to ecotourism satisfaction. When the tourist is satisfied, they develop psychological ownership towards the destination. From the study, psychological ownership is determined by various factors. They include post-trip experience, social influence from social media, and family and friends, and satisfaction (Zare, 2019). Psychological ownership leads to ecotourism loyalty. This is because tourists tend to develop connection with certain features in the destination that created a positive experience. Therefore, they will tend to revisit such destinations often to fulfil their emotional connection with the specific features. They will also tend to recommend such destinations to other potential tourists (Lee & Kim, 2020).

However, there are circumstances where the destination managers create a false image of their destinations in order to attract the attention of potential tourists. Such false information creates expectations in the mind of the tourist. During the actual visit, the tourist destination may fail to fulfil such expectations. This in turn leads to a bad experience which translates to dissatisfaction, and they may develop a negative image about such destinations. Negative destination image may influence other potential tourists negatively and they may shun such destinations. On the other hand, when the information about a particular destination is factual, genuine expectations are created and such expectations are likely to be fulfilled during the actual trip. As a result, the tourists generate a feeling of ownership towards such destinations and may influence others positively about such destinations.

## Limitation and future research

Several limitations were encountered during the research. Firstly, the study was mainly limited to Vietnam; therefore, its generalization was limited too. Future research should take place in other destinations in other countries. Secondly, the study involved the post-trip responses, which may have provided limited data. Future research should focus on different occasions before the trip, during the trip, and after the trip. The study should start at the initial stages of the trip. Thirdly, the study was mainly limited to ecotourism. Future research should focus on other forms of tourism as well.

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# IMPACT OF CULTURAL DIFFERENCES ON LOYALTY PERCEPTION

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**Purpose:** The key objective of this study is to investigate whether the cultural and geographical differences are significant within the context of destination loyalty.

**Design/methodology/approach:** The perception of the Czech Republic as a tourist destination as well as the impact of American, Russian and Finnish nationalities on tourist loyalty towards the Czech Republic were examined. Multiple regression analysis (OLS method) was used in order to evaluate the impact of particular image factors on loyalty indicators and the Kruskal-Wallis test was used to evaluate the dependence of image factors on the respondents' personal characteristics.

**Findings:** Cultural monuments played the biggest role for the American and Finnish respondents. On the other hand, safety and food quality were the most important factors for the Russian respondents. Regardless of the nationality, there are four high-priority factors - cultural and natural attractions, safety, and acceptance by the locals. The closer attention should be therefore paid to factors of safety and acceptance by the locals, as they can be to some extent, altered by the government.

**Research limitations:** The data were obtained before the COVID-19 pandemic. Consequently, the Czech Republic perception might differ from the pre-COVID-19 era.

**Practical implications:** The results of this paper can be used by various service providers in central European countries, that are mostly oriented on cultural and city tourism, for their marketing and management plans as well as campaigns. Service providers can also use these results to better target their visitors and their offerings to them.

**Key words:** cultural differences, destination image, loyalty, the Czech Republic.

**JEL classification:** Z30, M14, L83.

## Introduction

As a result of pandemic restrictions, there is a substantial decrease in the number of tourists, both on domestic as well as international level. Therefore, the loyal visitors might be seen as a huge benefit for various service providers and destinations in the post-COVID-19 era. Not only does loyalty help to reduce marketing costs that can be used to ensure several health and safety requirements regarding COVID-19 (Zhang et al. 2014), loyal visitors are also inclined to stay longer at the destination (Lau, McKercher 2004).

However, to ensure visitors' loyalty is not an easy task, as there is a great number of factors that have an impact on loyalty, e.g. visitors' satisfaction (Forgas-Coll et al. 2012), destination image (Chi, Qu 2008), perceived value (Chi 2012), uniqueness of destination (Usakli, Baloglu 2011), political stability and safety (Loi et al. 2017), visitors' personality (Skogland, Siguaw 2004) and even the cultural differences (Chen, Gursoy 2001).

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Cultural differences are not only influencing the visitors' loyalty, they might also lead to different perceptions of destination and their tourism services and can therefore influence the destination image formation and perception (Chen, Tsai 2007). Hence, the purpose of this study is to evaluate the impact of cultural and geographical differences on the destination loyalty perception.

## Literature review

In the tourism sector, loyal visitors are highly desirable and perceived as a competitive advantage among other destinations and service providers (Sun, Chi, Xu 2013). Therefore, loyalty has become one of the most researched topics in the tourism industry. For instance, Hultman et al. (2015) define visitors' loyalty as a degree of attachment to a particular destination. On the other hand, some authors, like Su, Cheng, Huang (2011), identify destination loyalty from a psychological perspective, as a complex socio-psychological structure that is influencing tourist behavior and emotions.

Accordingly, tourist loyalty, behavior and emotions are influenced by various psychological and demographic factors, such as motivation, lifestyle and visitors' personality (Beerli, Martin 2004). All of these factors are to some extent influenced by the culture that visitors come from. Moreover, culture has an impact on visitors' values and behavior (Govers, Go, Kumar 2007) as well as destination image perception (Bonn, Joseph, Dai 2005). Therefore, according to Lopes (2011), the country of origin is the most important demographic factor.

Moreover, demographic factors such as age, travel distance or even the country of origin has an impact on tourists' revisit intention (Štumpf, Vojtko, Janeček 2020), travel motivation (Swarbrooke, Horner 2007), destination choice and tourist behavior (Jackman et al. 2020).

On that account, it can be assumed that image and loyalty perception might significantly differ with regard to cultural and geographical differences. It is therefore inevitable to evaluate this assumption as it might provide useful insights into the destination loyalty formation.

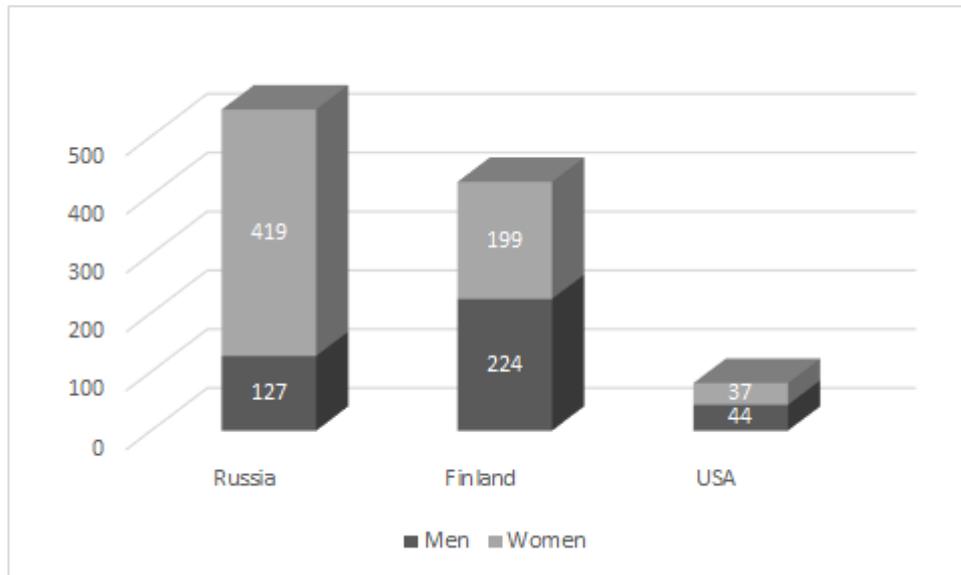
## Methodology

The key objective of this study is to investigate whether the cultural and geographical differences are significant within the context of destination loyalty. In order to achieve this objective, the primary data among American, Finnish and Russian respondents were collected. The data were obtained via an online questionnaire and structured interviews during 2017 and 2019.

The detailed sample structure is presented in *Figure 1*. Unfortunately, we were not able to apply quota sampling based on gender in the case of Russian respondents.

Based on Chen, Tsai (2007) we used two loyalty indicators, intention to revisit the Czech Republic sometime in the future and intention to recommend the Czech Republic to friends and family. In addition, the researched image factors were

formulated based on previous studies (Nunkoo 2013; Zhang 2013; Wu 2016; Ryglová et al. 2018; Viet 2019).



**Figure 1. Sample Structure**

Source: Own Processing

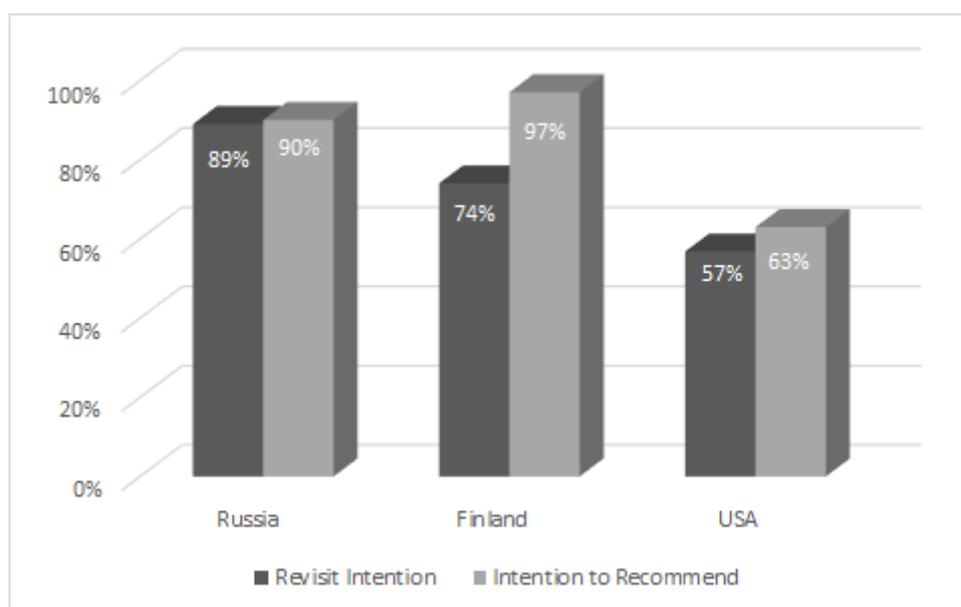
To assess the impact of image factors on the two loyalty indicators, a multiple regression analysis using the OLS method was used. Furthermore, Kruskal-Wallis test was used to evaluate the dependence of image factors on the respondents' characteristics, like age or gender.

## Results and discussion

As it was mentioned in the literature review, tourist loyalty is one of the most crucial issues in tourism regarding the post-COVID-19 era. It is therefore inevitable to know whether the cultural as well as geographical differences have an impact on tourist loyalty perception.

If we look at *Figure 2* we can see that the different nationalities evaluate the particular loyalty indicators differently. Compared to Russian and Finnish respondents, the least loyal to the Czech Republic were American respondents. Only about 57 % of those Americans who already visited the Czech Republic would come back in the future. Looking at the recommendation, almost 63 % of American respondents would recommend the Czech Republic to their friends and family.

This might be the result of the great geographical difference between the Czech Republic and the US (compared to Russia and Finland, the United States are farthest from the Czech Republic). However, roughly 75 % of American respondents were satisfied with their stay in the Czech Republic, which is a very favorable situation for service providers.



**Figure 2. Loyalty Indicators**

Source: Own Processing

On the other hand, the most loyal to the Czech Republic, among other researched nationalities, are Russians. This is also evident from the analysis of CzechTourism, where the main information sources for Russian visitors were recommendations from friends and family, as well as travel agencies, the internet, and their own experience (Country Report Russia 2020).

Furthermore, the results of our research indicate that more than 61 % of the Russian respondents received their information regarding the Czech Republic from their acquaintances, followed by the internet (almost 43 %) as well as the social media (approximately 18 %).

Same goes for the Finnish respondents, where their own experience (nearly 69 %) has the largest influence on their destination selection process, closely followed by their friends and family (more than 60 %), as well as the social media (approximately 29 %).

Moreover, the intention to recommend is stronger than the intention to revisit the Czech Republic. This is especially evident in the case of Finnish respondents. That might be caused by the fact that some tourists are visiting particular destinations to experience something new. Nevertheless, further research is needed to confirm this claim. On the other hand, according to Gursoy, Chen, Chi (2014), the intention to revisit a certain destination is rather small, because of this reason. Furthermore, the referrals are considered as a valuable source of information, especially in the tourism sector (Beerli, Martin 2004).

If we look closely at the various image factors based on the respondents' nationality, we can see substantial differences in their evaluation. Americans evaluated the cultural monuments the highest. Furthermore, they perceive the historical monuments of Prague as the unique attractions of the Czech Republic. In a similar manner, Finnish respondents evaluated the cultural monuments the highest as well. Contrary to Americans, they also rank the perception of the Czech Republic as a beer country very high. On the other hand, safety and food quality were the most important factors for Russian respondents. They also evaluated price category factors higher compared to other researched nationalities.

Regardless of the respondents' nationality, there were four high-priority factors that play a crucial role in loyalty perception. Those factors are cultural and natural attractions, safety, and acceptance by the locals. The closer attention should be therefore paid to factors, safety and acceptance by the locals, as they can, to some extent, be altered by the service providers or policy makers. Moreover, the perception of a safe country is very crucial, especially during the COVID-19 restrictions. Hence, it should be the main focus of every Czech DMO (Destination Management Organization).

Nevertheless, the results of Kruskal-Wallis test confirm the dependence of image factors on gender of respondents. In case of American and Finnish respondents, men evaluated researched image factors higher than women. Contrastingly, Russian women evaluated these factors higher than men. However, this might be the result of the low number of men among Russian respondents. Moreover, the Kruskal-Wallis test confirmed the dependence of image factors on the respondents age, but the results were not that significant as in the case of respondents' gender.

Since American visitors represent 5.4 % of all non-resident tourists that visited the Czech Republic in 2019 (CSO 2020a) and represent the fifth source country (which is the highest among researched nationalities) for the Czech Republic (CSO 2020b), the regression analysis for American visitors was performed. The results of this analysis are presented in Table 1 and Table 2.

**Table 1. Regression Analysis – Intention to Revisit**

Intention to revisit	Reg. coefficient	P-value
Constant	0.192	0.828
Acceptance by the locals	0.379	0.010
Staff quality	0.295	0.022
Price	0.236	0.094

Note:  $R^2 = 0.173$ ;  $R^2_{adj.} = 0.139$ , 10 % significance level

Source: Králiková, Ryglová, 2021

**Table 2. Regression Analysis – Recommendation**

Recommendation	Reg. coefficient	P-value
Constant	0.932	0.207
Price	0.292	0.014
Acceptance by the locals	0.240	0.049
Staff quality	0.225	0.036

Note:  $R^2 = 0.176$ ;  $R^2 \text{ adj.} = 0.142$ , 10 % significance level

Source: Králíková, Ryglová, 2021

Overall, there are three image factors that have an impact on intention to revisit as well as recommend the Czech Republic to their acquaintances. Similarly, as for the highest ranking factors by various nationalities, those three factors (acceptance by the locals, staff quality and price) can be, to some extent, altered by the service provider or DMOs. It is therefore very crucial to pay attention to these factors, especially when dealing with visitors' loyalty.

## Conclusion

This paper provides useful insights into the loyalty perception among various nationalities. Based on the results we confirmed that there are differences between the evaluation of loyalty indicators, intention to revisit and recommend the Czech Republic, among American, Russian and Finnish respondents. The biggest difference can be seen in loyalty perception of American respondents, which might be caused by the great geographical distance between the Czech Republic and the US. Furthermore, there are four factors that are significant for the respondents, regardless of their nationality. It is therefore inevitable to pay closer attention to those factors (cultural and natural attractions, safety as well as acceptance by the locals).

Hence, the results can be used by various service providers in central European countries, that are mostly oriented on cultural and city tourism, for their marketing and management plans and campaigns. Service providers can use these results to better target their visitors and offerings to them.

However, there are some limits that should be addressed in the future research. Firstly, the data were obtained before the COVID-19 pandemic. Consequently, the current perception of the Czech Republic might differ from the pre-COVID-19 era. Secondly, the respondents' structure differs among researched nationalities. Therefore, future research should be more balanced regarding the respondents' sample structure.

## Acknowledgements

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# SHARED ACCOMMODATION: CURRENT STATE AND POSSIBILITIES OF ITS DEVELOPMENT ON THE ISLAND OF MADEIRA

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## Abstract:

**Purpose:** The aim of the paper is to analyse the current state and identify the potential for the development of shared accommodation in Madeira Island. Next goal is to identify barriers of its development based on the results of research about this type of accommodation and reduce them.

**Design/methodology/approach:** The literature review offers the basic understanding about information about sharing economy, but bigger focus is then on shared accommodation. The literature review also targets on the regulation of AirBnB in the world and the situation with AirBnB in the world. The research itself was divided into two sections. The first section is based on online questionings and the second on individual interviews. Online questionnaire survey is split up into two parts, the first part is focused on visitors from all over the world, who use shared accommodation, trying to find out, how travellers evaluate this specific type of accommodation and the second part is focused on providers of shared accommodation on the island of Madeira. To find out more opinions about shared accommodation, 10 individuals were approached. The individuals were asked questions, which were similar to the first survey, but more in depth. Respondents were asked for reasons and any thoughts about AirBnB. The data from both surveys were processed in program PSPP and Microsoft Excel.

**Findings:** Based on questionnaires it turned out that in many ways, answers of demand and supply are similar. Most respondents found out about AirBnB on the internet, the majority of both groups think that AirBnB is better than hotels and that AirBnB helps to develop tourism in the area but also that AirBnB is turning mainly into businesses and does not meet the main purpose of shared accommodation. The results also show that people are greatly influenced by reviews and without them, the chance of booking the accommodation is getting lower. Other answers indicate that most visitors prefer separated accommodations and most providers provide the entire homes with full privacy, so it collaborates very well. The research did not show significant difference in answers between genders.

Respondents of demand shared their negative experiences such as noise, smell, not good communication with the host, not clean place but also positive experiences such as a little gift, clean place, reasonable price, kind host etc. The negative findings were recorded as barriers of the development and some tips how to improve their offer were suggested to providers, Tips how to behave when choosing and staying in AirBnB were also suggested to visitors. Individual interviews helped to understand why people prefer AirBnB rather than hotels and it is mostly because of privacy, the kitchen area and the unique experience.

**Research limitations:** The biggest limit is the focus on local environment of Island of Madeira that could be specific then overall worldwide environment. The second limit is based in research methodology. It was used online survey and research sample is limited (157 users and 30 providers of shared accommodation). The last limitation is time of research. The conditions of tourism and also shared accommodation are very influenced by COVID-19 pandemic.

**Key words:** AirBnB, shared economy, shared accommodation, Madeira Island

**Jel code:** Z31, Z33,

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## Introduction

In the 21st century, people are used to travel as never before. Thanks to globalization, ability to speak foreign languages, especially English, it is easy to visit places that our older generation could just dream about. The trend living like local is becoming more and more desirable and platforms for shared accommodation seem to be a way, how to achieve this desire. The segment of sharing economy starts to significantly change the accommodation market and attract the attention of regulatory authorities and entrepreneurs. (Krajcik, Kljucnikov & Rihova, 2019) It is not all about shared accommodation but about sharing economy in general. People want to share cars, bikes, tools and so on. This paper is focused on shared accommodation, the research itself is focused just on AirBnB.

The aim of the paper is to analyse current state and identify the potential for the development of shared accommodation in Madeira island. Next goal is to identify barriers of its development based on the results of research about this type of accommodation and reduce them. At the beginning there is providing information about the area of research, Madeira, and all the assumptions mentioned in the paragraph above. Next, the paper continues with the research. The research itself was divided into a few sections. The first section was based on online questionings and the second on individual interviews. Online questionnaire survey was split up into two parts, the first part was focused on providers of shared accommodation on the island of Madeira, and the second part was focused on visitors from all over the world, who use shared accommodation. The base of individual interviews was similar to the questionnaire for visitors, but it was directed more in-depth.

## Literature review

Sharing economy, also known as peer-to-peer based sharing, is a concept that emphasizes ability and preferences of people who prefer to rent or borrow something instead of owning things. This type of sharing became a trend at the turn of the 21st century.

People have always exchanged goods or services but nowadays thanks to technologies and free information, there is a new market model. There are three forces that started this model – modern trust, technologies and economic pressure. (Siuskaite, Pilinkiene, & Zvirdauskas, 2019) Modern trust - the concept of sharing economy depends on something that previously seemed foolish or unthinkable, trust. People rely on other people cars (e.g. Uber), welcome strangers into their homes (e.g. AirBnB, Homeaway) or lend their belongings to the strangers. (Stemler, 2016) For someone, it might seem inconceivable to let strangers stay in your place or to accommodate yourself by strangers, but surprisingly, it works very well. Technology – technology is necessary for the development of the sharing economy in three ways – free information, lower transactions costs and it regulates behaviour. In the 21st century, many people have access to the internet (2018, 55 % of the population), (Statista, 2019) and it is incredibly easy to contact someone when you have free bedroom or spot in a car. Thanks to high-speed internet and lower costs of

smartphones (the average price of smartphones is 250 €, (GfK Czech Republic, 2017).

Economic pressure - economic pressure greatly participated in the formation of the sharing economy. Many of the sharing economy companies were founded between 2008 and 2010, in the aftermath of the global financial crisis. In this time, people were looking for different ways to save money and for ways how to make money. "With fewer full-time jobs, Americans were forced to take temporary work, and the sharing economy provided many sources of temporary jobs." (Stemler, 2016) Sharing economy surrounds all of us and sometimes we do not even know about that. Most known is probably apartment renting or car sharing, but sharing economy appears in more and more fields today. We can find the elements of the sharing economy in knowledge and talent-sharing, peer-to-peer lending, reselling and trading, co-working or even healthcare. (Sundararajan, 2016)

The principle of shared accommodation is known for many years, when people share their living with people that are not family members. The reason for this type of living is growing rents and basically unaffordability to rent for example whole apartment. The majority of people who live like this are single, mostly young people, for example students. (Heath, Davies, Edwards, & Scicluna, 2017) However, shared accommodation on which this paper focused, has different principle. Modern shared accommodation is mostly short-term, for holiday rent, business trip etc. Sharing economy in general experienced rapid growth in the past five years and expressly shared accommodation is growing due to demand preferences changes. Travelers prefer to organize their own program, they are not seeking for support of travel companies and they like the benefit of the apartment, feeling like being at home. (Surugiu, Surugiu, & Mazilescu, 2019) Rapidly grown sharing platform Airbnb brings many benefits not only to the customers, but also to the cities, by attracting more tourists and bringing financial and economic benefits, but unfortunately at the same time imposes the quality of life of the local citizens, influences housing and hotel markets. (Krajcik, Kljucnikov & Rihova, 2019; Chamusca et al., 2019) The impact of Airbnb is not equally in each part of countries and also cities. According to Hübscher et al (2020) there is strong concentration of Airbnb listing in the centres. Short-term rentals become more attractive even in peripheral districts where rents increase and flats are taken off the traditional rental market. This will lead to new conflicts in the city because the peripheral districts are more vulnerable from a socio-economic point of view.

AirBnB is probably the most famous portal for sharing accommodation. The company was founded in 2008 by schoolmates, Brian Chesky, Joe Gebbia and Nathan Blecharczyk. The company is headquartered in San Francisco, California and currently has about 3100 employees. "Airbnb's mission is to create a world where people can belong through healthy travel that is local, authentic, diverse, inclusive and sustainable." AirBnB offers more than 5 million places to stay, operates in more than 81000 cities in 191 countries in the whole world. The access to the service is via the website and mobile app. (Airbnb, 2018) Largest Airbnb cities outside of the US are Paris (47 000 places), London (31 000), Rome, Rio de Janeiro, Barcelona, all about 19 000 places, Copenhagen (15 000), Milan (14 000), Sydney and Amsterdam

(13 000). The most money makes hosts in London, Dubai, Zermatt, Cannes, Venice and Sydney and the cheapest accommodation can offer Salvador, Havana, Sarajevo, Bucharest, Sochi and Sofia. The highest AirBnB demand is in Tokyo, Melbourne, Osaka, Vancouver, Lisbon, Berlin and Amsterdam. (Shatford, c2015-2018) Booking home on AirBnB is very simple. Guests can search for a place using filters such as size, location, price and dates. Before booking, personal and payment information is necessary to provide to the host and after that, a person just has to wait for the message of acceptance. Hosts choose which dates they would like to accommodate someone and then it is time to wait for guests.

While some people really love the idea of AirBnB, AirBnB is becoming a quite controversial topic to discuss. For tourists, the idea of cheaper accommodation might sound phenomenal, but for people who live in the cities such as Amsterdam, Berlin or others often visited, AirBnB is becoming a bit a nightmare. The prices of apartments are growing rapidly fast, AirBnB owners sometimes do not pay taxes, especially young tourist on holiday might be loud, so having an apartment next to the AirBnB place might not be very pleasant. (Heckman, 2017) There is not only AirBnB, but there are many platforms for sharing accommodation e.g. Couchsurfing, Flatio, Flatmates.com, HomeAway etc. We consider that AirBnB is the biggest provider of sharing accommodation. Some big problems are identified with this and because some states development new roles for sharing accommodation. Through the last few years, the main concept of AirBnB has changed greatly. It is not only about offering spare place anymore, it has become a huge business opportunity. That causes a problem for many cities. People choose to rent their property through AirBnB because of bigger income rather than renting the property to locals. Some cities have already decided to regulate renting because basically, locals do not have a place to stay anymore, e.g. San Francisco, Berlin, London, Amsterdam, Barcelona, Prague etc.

## **Methodology**

The aim of the paper is to analyse current state and identify the potential for the development of shared accommodation in Madeira island. Next goals are to identify barriers of its development based to reduce the negative impact and barriers connected to this type of accommodation. For the research was the research question developed. How is the difference between origin of sharing accommodation and current state of it? This question need to be studied more in detail. Partial questions are focused on both supply and demand side of tourism market in Madeira island.

The first step was the study of theoretical background and elaboration of literature review based on printed publications, web portals and professional publications. In the beginning is the literature review related to sharing economy in general, than more specifically in shared accommodation.

The next step focuses on quantitative research, that consist of two kinds of survey, interviews, the analysis of data and suggestions for owners that offer places through AirBnB.

The first survey was aimed to the visitors, to find out, how travellers evaluate this specific type of accommodation. The number of respondents that were engaged in data collection was 157. The questionnaire was shared mostly through social media, through Google Form, because the aim was to gain as many different cultures as possible. At the end of the research, people from 40 countries were engaged, 68% women and 32% men.

The second survey was focused on providers of accommodation that offer place on Madeira island. This segment was much smaller, so the number of questionnaires was estimated to 30. It is impossible for researcher who does not have access to details of AirBnB to find out the exact number of home providers. The number of listing in Madeira is about 5000, but some properties are owned by the same person or even a company, so the exact number remains a mystery. Owners were contacted through AirBnB portal. The gender representation was 47 % women and 53 % men.

The structure of both surveys was very similar. The questionnaire included open-ended and closed-ended questions, obviously demographic questions and also Likert scale questions.

The data provided by questionnaires were collected in the year 2018 and the beginning of the year 2019. The data from both surveys were processed in program SPSS that enable to sort the data and to make contingency tables. For the graphical representation, Microsoft Excel was used. To find out more opinions about shared accommodation, it was communicated with 10 individuals. The individuals were asked questions, which were similar as in the first survey, but more in depth. Respondents were asked for reasons and any thoughts about AirBnB.

## Results

Madeira is very open to shared accommodation, on the 18th of April 2018, there were 4,604 rentals including Porto Santo with 110 rentals. The picture one shows the dissemination of shared accommodation on the island. The visitor can choose an entire home, private room (shared common areas) or shared room (with someone else). The most extended offer is to rent the entire home (4 220 rentals, 92%). There are 350 private rooms (7%) and only 34 shared rooms (1%). Each rental has a different size. The most common rental (entire home) is with two bedrooms (32,5%) and one-bedroom (32,5%), the others (35%) - studio 2%, three-bedroom 22%, more bedrooms 11%. Price of the rental obviously depends on the choice of visitor (entire house, only room etc.). The average pricing for entire home is 58 €, private room 37 € and shared room 16 €. The month, which generates the most revenue per available rental, is August, followed by July and September. The second half of January and the first half of December are the weakest parts of the year. During March 2018, 2 221 rentals had at least one booked night. That means that the occupancy was 55 %. Naturally, the most rentals are in the capital, Funchal, but whole south seaside is full of rentals. In the north there are rentals only in bigger cities such as Porto Moniz, Sao Vicente, Santana or Porto da Cruz. (AirDNA, c2015-2019)



difference was however in number of shared rooms. The number has decreased by unbelievable 50%.

**Table 1. AirBnB comparison in time**

Period	April 2018	August 2019	Results
<b>Pricing</b>			
Entire home	58 €	70 €	+ 20%
Private room	37 €	34 €	-9%
Shared room	16 €	15 €	-7%
Occupancy	55 %	65 %	+18%
<b>Number of rentals</b>			
Entire home	4 604	5 292	+15%
Private room	4 220	4 850	+14%
Shared room	350	425	+21%
Shared room	34	17	-50%

Source AirDNA, 2019

### **The analysis of demand**

At the beginning of the research, respondents were asked where they found the option of accommodation with AirBnB. Most frequent answers were the internet with 49%, the next was a friend with 31%, social media with 15% and 5% of respondents have chosen the other option. We can see the difference between ages especially with the answer social media, nobody older than 50 years has answered this source. The answer social media was mostly recorded from respondents within 21-30 years, specifically 17 respondents.

The next question focuses on the year of becoming a member of the AirBnB community. This style of travelling is still quite young, many people joined the community just a few years ago. The most answered year was 2016 with 39 responds, 2017 and 2018 with 28 responds. Only 7% of respondents joined the community earlier than in 2013. In comparison between genders, we can see that the most females joined AirBnB in 2016 (28 females), meanwhile most males joined AirBnB one year earlier, in 2015 (11 males).

The table 2 shows the reason for joining the community. The majority answered "Cheaper accommodation" with 70%. 14% respondents chose "other" that includes local experiences, bigger accommodation than just a hotel room, accommodation with a kitchen and living room, options for travelling with a group, residential neighbourhood. Another 12% chose "I wanted to try something new" and almost 5% wanted to meet more locals. The most students choose AirBnB for cheaper accommodation, the same choose workers, but workers have bigger impact in section "I wanted to try something new.", meanwhile students do not.

**Table 2. The reason for joining the AirBnB community according to the status of respondent**

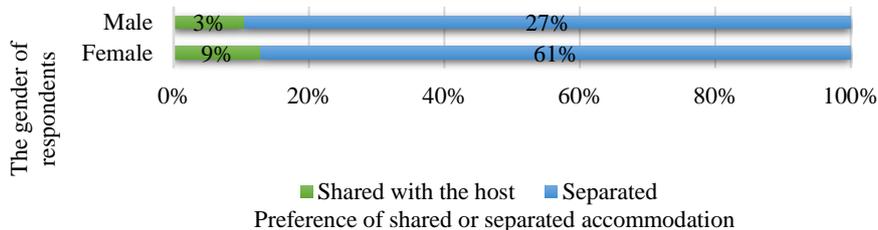
	Student		Worker		Self-employed		Retirement	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Cheaper accommodation	45	82	48	72	11	52	4	36
I wanted to try ...	5	9	10	15	3	14	2	18
Meeting locals	1	2	4	6	1	5	0	0
Other	4	7	5	7	6	29	5	45

Source: Own elaboration, 2019

The next question focus on the frequency of using AirBnB. 43,9% of visitors use AirBnB only 1 time per year, 37,6% 2-3 times per year, 11,5% 4-5 times per year. We can guess that majority of respondents use AirBnB for the bigger holiday, which are commonly one time per year.

Preferences about host’s gender are: 83% do not mind about gender, 15% prefers female as a host. We can assume that it is because in most cases, there is separated accommodation and the contact with the host might be very small. However, when someone prefers a gender of the host, it is mostly the case that woman prefer woman rather than a man as a host.

In the figure 2, we can see the preferences about separated and shared accommodation. The results are quite a one-sided, most people would rather choose separated accommodation (88%) than sharing the place with the host (12%). This might be a little surprising, because one of the main purposes of AirBnB is to live like local and meet locals that is easier when you live in the house with one.



**Figure 2. Guest’s preferences about type of accommodation**

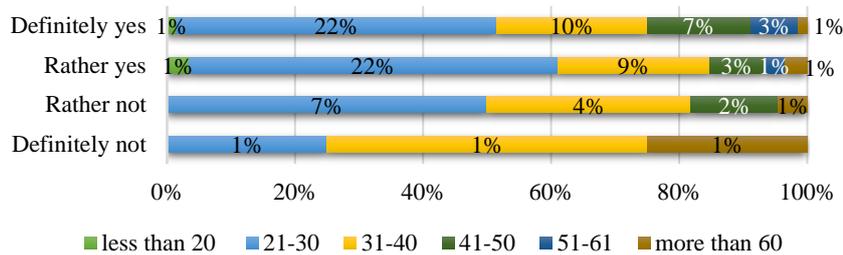
Source: Own elaboration, 2019

The majority of respondents (96,2%) do care about reviews and only 3,8% do not. The next question about reviews was asking if people would accommodate themselves in a room without review, 47,1% would not, 19,1% would, and the rest is not sure. The last question in this review set was asking if people would accommodate themselves in a room with bad review, 13, 4% would and 86, 6%

would not. In comparison between genders, that more males are willing to accommodate themselves in a room with bad review and thereby give a host a second chance.

The aim of this shorter block was to find out positive and negative experiences. The question was asking if people have a negative experience with AirBnB and the answers were about even, 53% of respondents did not face any negative experience so far, 47% did.

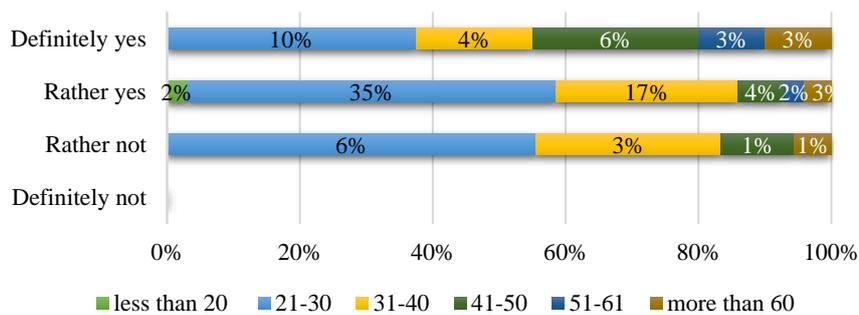
The negative experiences are mostly smell, noise, dirty place or host who does not speak English, then the cat in the house without warning, keys that did not work, flat above noisy pub, fake pictures, not so professional approach of the host, high service fees and lack of support from the company. On the other hand, visitors also have positive experiences such as a box of chocolate or fruits as a welcoming surprise, nice talkative hosts, pleasant accommodation, cheap price, cleanliness, meeting wonderful people, home feeling, privacy, fully equipped kitchen and so one.



**Figure 3. Tourism development according to the age**

Source: Own elaboration, 2019

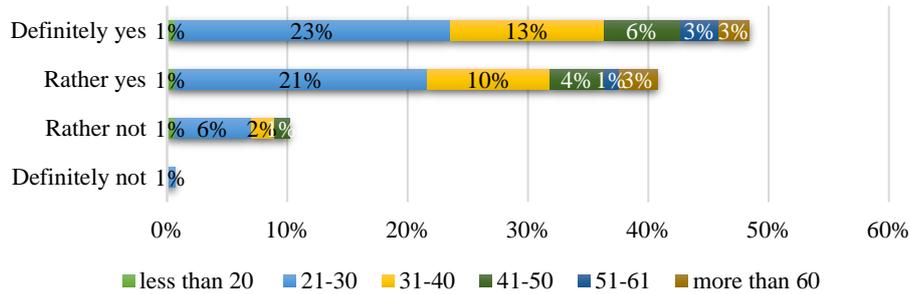
Respondents were also asked if they think that AirBnB helps to develop tourism in destination. 82% said “Definitely yes” or “Rather yes”, 18% said “Definitely no” or “Rather no”. The next question focuses on the safety of AirBnB. 89% of respondents consider AirBnB safe, but 11% said “Rather not”. We can guess that it might be because the location of the accommodation could be in a busy area or in not a very popular part of the city. Little distrust was recorded especially between ages 21-30 and also between ages 31-40.



**Figure 4. AirBnB safety according to the age**

Source: Own elaboration, 2019

The last question in this section was asking if AirBnB is turning mainly into business nowadays. 87% of respondents said “Definitely yes” or “Rather yes”, 13% does not think that.



**Figure 5. AirBnB as business**

Source: Own elaboration, 2019

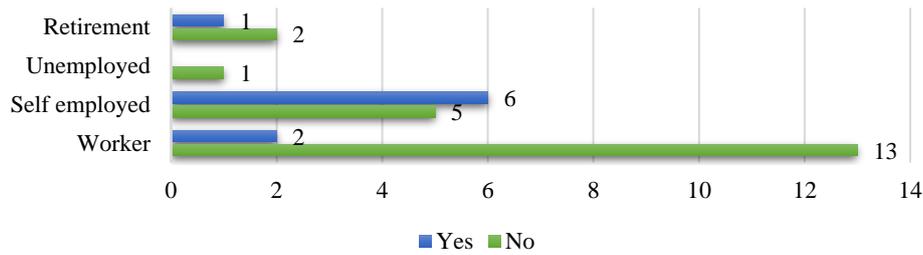
**The analysis of supply**

The analysis of supply is based on answers from respondents from Madeira, who offer their accommodation through AirBnB channel.

At the beginning, respondents were asked when they became a part of the rental community. 33% of respondents answered the year 2017, 27% answered 2016, 20% said 2015 and 17% became a member earlier than 2015. The last 3% of respondents joined the community in 2018. It is obvious from the figure 6, that the number of providers is growing with time and second thing we can see is, that males joined the joined AirBnB earlier than females. The biggest reason for joining the rental community was income (80%). Meeting new people reach only 20% of answers. From the comparison between genders, it turned out that the reason for males was income with 94%, and only for 6% males was the reason meeting new people. The situation is different with females. 64% of them started with renting because of the income, but 36% of females wanted to meet new people.

In the following question, providers were asked, what type of accommodation they provide. 90% of respondents provide an entire home and 10% provide a private room in their home. We can say that nearly the same ration was detected with visitor’s preferences.

The following question focuses on income. The income from renting is the main income for 30% of providers, the rest 70% do not count renting as a main income, but just as an extra earning. We can see from the figure 6, that the income from renting is the main income in most cases for self-employed people.

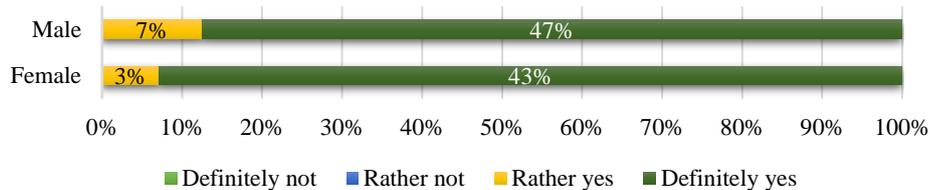


**Figure 6. Rental as the main income**

Source: Own elaboration, 2019

As visitors, providers were asked for their negative and positive experiences about renting. More than 50% of respondents did not face any negative experience, the rest mentioned, for example, rude clients, bureaucracy, the taxes and jealousy of the customers because of the host’s home and also guests who do not speak any other language than their own and they expect the host to understand that language. Positive experiences are primarily meeting new interesting people from over the world, quick payment, reliability, presents from visitors and many bookings.

Next, people were asked if there is enough shared accommodation in Madeira. 70% of respondents answered “Definitely yes” or “Rather yes”, 30% said “Rather not” or “Definitely not”. In detailed evaluation, it is clear that people who answered “Rather not” or “Definitely not” were not even close about their guess how many Airbnb’s are in Madeira in one of the previous questions. Their guesses were often lower than 1000.



**Figure 7. The development of tourism**

Source: Own elaboration, 2019

The last question is focused on thoughts if this type of accommodation helps to develop tourism in Madeira. The results from this question are pretty one-sided. 90% of providers said “Definitely yes” and 10% said, “Rather yes”. Nobody has doubts about this question. It is obvious that AirBnB helps to develop tourism in Madeira, but we can ask ourselves, when it is enough or even too much. There might be a thin border between developing tourism and destroying the city as you can read about AirBnB situation in literature overview at the beginning of this paper.

**Conclusion**

The main aim of this paper was to analyse the current state and identify the potential for the development of shared accommodation in Madeira island. The

second goal was to identify barriers of its development based on the results of research about this type of accommodation and reduce them. Research could offer some answers on the main research question. Commercial focused of sharing accommodation is clear. The Airbnb become a business model instead of philosophy of travel and hosting.

Studying theoretical knowledge of sharing economy and more specifically shared accommodation shows that this topic is greatly popular these days in many different ways. Someone is supporter and perceives positively the idea of shared accommodation someone is the opposite. Supporters are mostly providers of accommodation because of extra income and travellers because of the opportunity to live more like local, reasonable prices and sometimes, uncommon types of accommodation. On the other hand, people who live in the area with many accommodation opportunities, in the city centre or have travellers next door are not very happy. Prices of rent are much higher, people on holiday are often noisier and the place is just crowded.

The research was assembled in a way that the demand and the supply of AirBnB can be compared. The supply was focused on specific destination, Madeira island, and the demand was focused on travellers from over the world. To gain more specific information, individual interviews were implemented.

Based on questionnaires it turned out that in many ways, answers of demand and supply are similar. Most respondents found out about AirBnB on the internet, the majority of both groups think that AirBnB is better than hotels and that AirBnB helps to develop tourism in the area but also that AirBnB is turning mainly into businesses and does not meet the main purpose of shared accommodation. The results also show that people are greatly influenced by reviews and without them, the chance of booking the accommodation is getting lower. Other answers show that most visitors prefer separated accommodation and most providers provide the entire home with full privacy, so it collaborate very well. The research did not show significant difference in answers between genders.

Respondents of demand shared their negative experiences such as noise, smell, not good communication with the host, not clean place but also positive experiences such as little gift, clean place, reasonable price, kind host etc. The negative findings were recorded as barriers of the development and some tips were suggested to providers, how to improve their offer. Tips were also suggested to visitors, how to behave when choosing and staying in AirBnB. Individual interviews helped to understand, why people prefer AirBnB rather than hotels and it is mostly because of privacy, the kitchen area and the unique experience.

There are limitations of the research. The research samples were not representative and results can't be generalized. There are need to continue in this type of research in follow up surveys and studied the topic more in detail. The timeliness is the second problem of research. The surveys were conducted before the covid-19 pandemic, that represent the usage of sharing economy state without macro impacts.

## Acknowledgment

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# STRATEGY OF TOURISM DEVELOPMENT AFTER COVID-19 PANDEMIC: RUSSIAN CASE

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**Abstract:** The covid-19 pandemic affected all areas of the economy including tourism sector. In the tourism sector, the epidemic has led to a deep crisis associated with the closure of borders. The consequences will lead to significant changes in the directions of tourism and the forms of interaction with consumers of services.

**Purpose:** The main goal of the study is to identify new directions of domestic tourism in Russia after the removal of restrictions related to the covid-19 epidemic and to identify prospects for the development of tourism for the subjects of the Russian tourist market.

**Design/methodology/approach:** The study used data from legislative acts of the Russian Federation, the Russian Public Opinion Research Center (VCIOM) data of opinion polls, scientific and practical periodicals on the development of the tourism industry.

**Findings** The crisis of the tourism industry has changed the strategy of tourism development in Russia. The players of the tourism industry market have to apply the advanced development strategy. The main directions of tourism development in Russia after the Covid-19 pandemic crisis are following: the development of new, innovative areas of domestic tourism; budget domestic routes, focusing on particular age groups and healthy lifestyle activities, increasing use of digital technologies in the both promotion and support of tourist products.

**Practical implications:** The comparative analysis of the preferences of Russian citizens in the tourism field allows creating the new strategy, forming new products and developing new directions in the tourism industry.

**Key words:** tourism, tourist products, consumers, preferences, strategy.

## Introduction

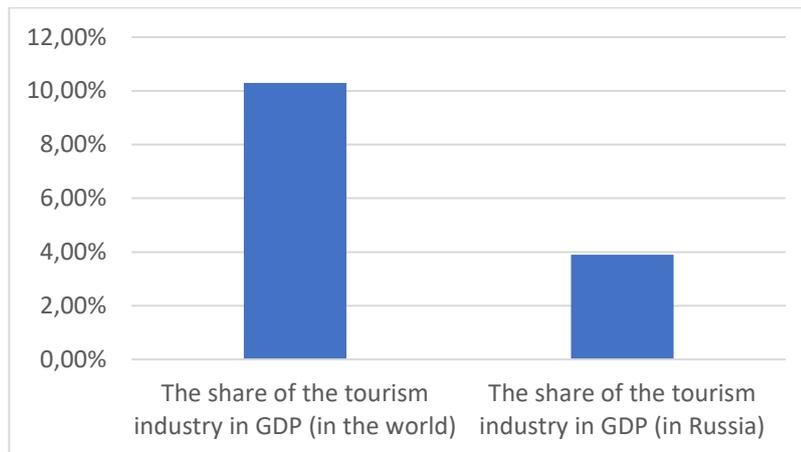
The tourism sector of the world economy accounts for about 10% of GDP. On the one hand, tourism is a catalyst for the development of various sectors of the country's economy, on the other hand, tourism is a vulnerable area of business. Changes in the economic situation, political events can act as conditions that hinder the tourism development as well as all the related areas. In the tourism sector, the Covid-19 pandemic has led to a deep crisis caused by the lockdowns and border closures. The consequences of the crisis will lead to significant changes in the priority areas in tourism and forms of interaction with consumers of the tourism services. Competition in this area will move to a different level, which will lead to a completely new distribution of resources in this market.

The statistical bulletin of the Rosstat, published on the occasion of the World Tourism Day, reflected the importance of the tourism industry in the both world and

<https://doi.org/10.11118/978-80-7509-820-7-0418>

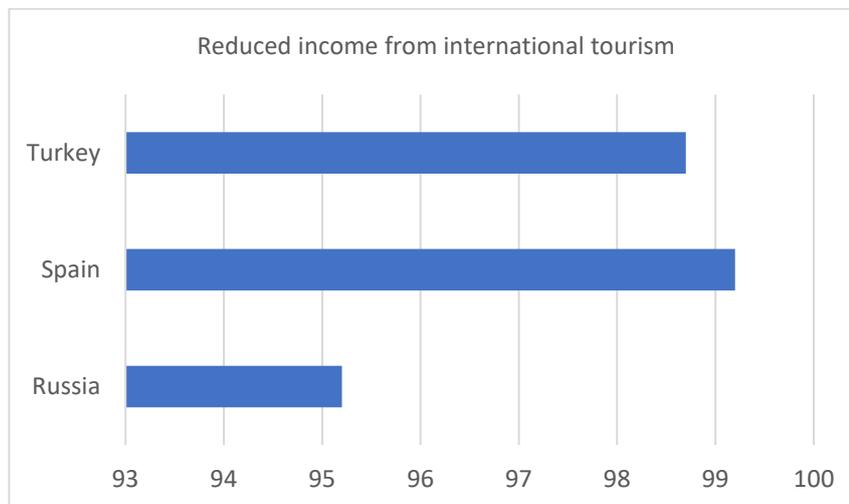


Russian GDPs. The data is shown in Figure 1. In addition, before the Covid-19 pandemic, a tenth of the world's working-age population worked in this industry.



**Figure 1. The share of tourism in world and Russian GDPs** (Rosstat Statistical Bulletin for the World Tourism Day 2020. <https://www.cci.lt/wp-content/uploads/2020/10>)

As shown in Figure 1, tourism accounted for 10.3% of global GDP in 2017-18. For Russia, this share was 3.9%, which is 0.9% higher than in the US, UK and Australia (rosstat.gov.ru). Due to restrictions related to the Covid-19 pandemic in 2020, international tourism was reduced by 95.2% in the world, 99,0% in Russia, 95,8% in the US, 99.1% in Spain, 100% in Thailand (rosstat.gov.ru).



**Figure 2. Reduced tourism income in Spain, Turkey and Russia** (Rosstat Statistical Bulletin for the World Tourism Day 2020. <https://www.cci.lt/wp-content/uploads/2020/10>)

Figure 2 shows the revenues percentage reduction of international tourism in Spain, Turkey and Russia. As shown in figure 2, revenues from international tourism has decreased by 95.2% in Russia, 99.2% in Spain, 98.7% in Turkey (rosstat.gov.ru).

The total number of tourists, including domestic travel, stay in hotels, has decreased by 87.9% in Russia, 99.2% in Belgium, 95.7% in Spain, 92,9% in Portugal. European countries have always attracted a lots of tourists. Therefore, the closure of borders, people's fear of Covid-19 infection, led to the fact that tourist flows disappeared.

The main factors in the sustainable development of the tourism business in Russia are: the opening of new tourist destinations, their transport accessibility, improvement of the citizens well-being and increasing interest in direct impressions from visiting new places (rosstat.gov.ru). People are becoming free to choose destinations for recreation, information support for hotel reservations is increasing, and state support projects for domestic tourism development are being implemented.

### **Literature review / Research Background**

Forecasting of the Covid-19 pandemic impact on the tourism sector faces a high degree of uncertainty and a rapidly changing epidemiological situation at the level of states and regions (Yu 2021, p. 1668). In 2020, there was a model of tourism development in the context of an epidemic outbreak, however, this model requires constant updating (Yang, Zhang, Chen 2020). Europe has the first place in the world ranking of tourist destinations. The study of the European countries was focused on the hotel owners' opinion about measures for restoring the travelers trust and the new tourism destinations formation after the Covid-19 pandemic (Volkman et al. 2021, p. 163).

The impact of the covid-19 pandemic on maritime tourism in Malaysia between January and the end of July 2020 was examined by Menhat et al. (2021) with predictions about the difficulty of restoring maritime tourism. Research on the relationship between risk-taking and the desire to travel has shown that stress levels are the deterrent. Social risk has the greatest impact. Financial risk is not so important (Falahuddin et al. 2020, p. 17). A study of changes in the tourism industry in Quebec (Canada) indicates that tourism in the long term can ensure the sustainability of the development of the region (Lapointe 2020, p. 635). In Lapland, where tourism is a strategically important sector of the economy, focus on regional tourism in the peripheral areas was studied using the example of the city of Kemi. It was recommended to strengthen the image of the city and develop its infrastructure. The tourism development in the city helps attract new investments, create new jobs, which contributes to the economic recovery (Ianioglo, Rissanen 2020, p. 523).

In connection with the tourism business sustainability, it is interesting to study the opinions of the restaurant owners as representatives of the accompanying business owners about new strategies that they will apply after the Covid-19 pandemic. The government support and strategies for tourism places availability development were identified as priorities in the restaurant business after the pandemic (Madeira, Palrão, Mendes 2021, p. 7). Research of the impact of the

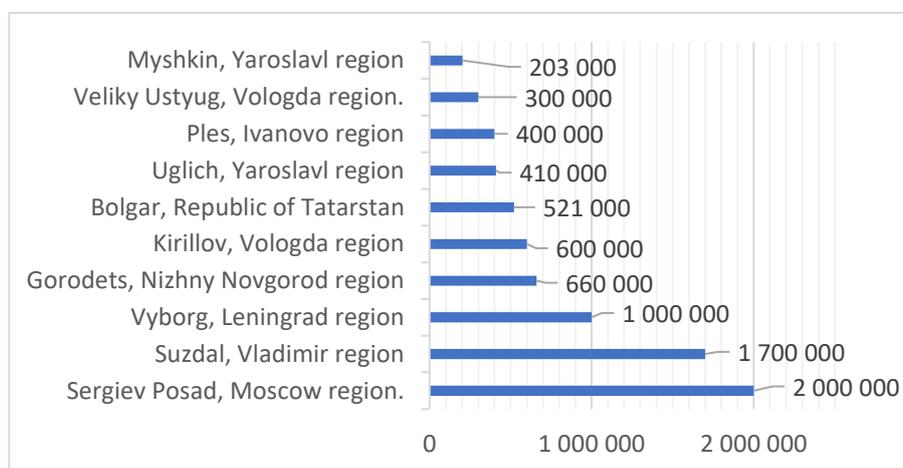
pandemic on the tourism business shows that the tourism industry must look for new ways to attract customers, use the opportunities of digital technologies and offer a tourist product in a new format that is interesting for consumers.

## Methodology

The main objective of the study was to identify the potential of domestic tourism to ensure the development of the national tourism industry in the difficult economic conditions after the Covid-19 pandemic. To achieve this goal, we used comparative, descriptive and statistical methods of research, as well as the method of analyzing scientific literature. The information for the study is obtained from the reports of the Official Statistics Service of the Russian Federation. Moreover, the study used data from legislative acts of the Russian Federation and the Russian Public Opinion Research Center (VCIOM) data of opinion polls on the development of the tourism industry. The statistical data were analyzed, which allowed us to draw conclusions that correspond to the tasks set.

## Results

A sociological survey conducted in Russia allowed us to identify the most popular destinations for domestic tourism. The main tourist destinations were associated with visiting the Russian capital Moscow and summer vacation destinations on seaside. The desire of tourists was more associated with holidays in sunny, warm regions with seaside and cities with the rich cultural and historical heritage (ecec.ru). As a perspective for the development of domestic tourism, we can note the fact that Russian citizens have shown interest in small cities in the European part of Russia, where monuments of cultural and religious heritage are concentrated. Figure 3 shows the most popular small cultural centers among tourists.



**Figure 3.** *Small towns popular with tourists in the European part of Russia* (Tourism statistics. Turazbuka NEWS™ (ecec.ru), <https://ecec.ru/statistika> )

The results of a survey of players in the Russian tourism market showed that beach and health tourism is returning to pre-crisis indicators. At the same time, the recovery of business tourism may be hampered by a number of factors, including the development of digital technologies. Experts in the tourism sector have identified several areas that will develop after the crisis associated with the Covid-19 pandemic. They are eco-tourism, sports, cultural, educational and children's tourism.

## Discussion

The development of domestic tourism in Russia may face a number of difficulties. The most important is the problem of tourist accommodation, which ensures the safety of living (ekec.ru). 10% of the Russian hotel fund has no service standards or category. Table 1 shows the percentage of hotels by region that do not have a category nor international service standards.

**Table 1. Percentage of hotels without a category** (Tourism statistics. Turazbuka NEWS™ (ekec.ru), <https://ekec.ru/statistika> )

Region	Percentage of hotels without a category
Northern	7
North-West	3
Central	13
Volgo-Vyatsky	6
Central Black Earth Region	3
Volga Region	12
North-Caucasian	10
Uralsky	14
West Siberian	12
East Siberian Far	10
Eastern	8
Kaliningrad region	1

The accommodation facilities in the rural areas are not enough for the development of ecological, village and sports tourism: 71% of hotels are urban and only 29% are located in country areas. (ekec.ru). The second problem is the positioning and promotion of new tourist destinations for domestic tourism. The third problem is the insufficient use of digital technologies in customer service, feedback, and constant interaction with customers (Desfontaines, Korchagina, 2019, p.10307). Finally, we have to mention that the assortment and quality of tours are often similar and not attractive for consumers. It can be concluded that in the context of the development of domestic tourism, consumers will strive to explore new areas. The most interesting are the historical facts about small towns that are not known to society.

## Conclusion

An analysis of the recovery of tourism in Russia after the covid-19 pandemic allows us to draw the following conclusions:

- the prospects for the domestic tourism development are associated with small cities in the European part of Russia, where monuments of cultural and religious heritage are concentrated;
- new tourist destinations development should include advantages of rural and sports areas with healthy lifestyles;
- the digital technologies implementation helps to advertise new destinations and constant contact with tourists;
- the attention should be paid to the hotel fund development in the regions and rural areas.

The development of domestic tourism in Russia is a positive factor for the new vectors formation of The Russian regional development and modern strategy for expanding additional values and services in accordance with the needs of modern travelers.

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## SUSTAINABILITY AND DESTINATION MANAGEMENT FROM CZECH PERSPECTIVES

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**Abstract:** The aim of destination management is to deploy resources to be competitive, and to steward destination resources to be sustainable (Ritchie & Crouch, 2006). The former is about the ability to compete in the tourism market, and the latter is about the ability to maintain the quality of physical, social, cultural, and environmental resources while competing in the tourism market. Mowforth and Munt (2009) present key techniques in sustainable tourism, e.g. environmental impact assessment, carrying capacity calculations, limits of acceptable change, area protection or visitor management techniques. Concerning sustainable tourism, further technique is the elimination of negative externalities through their internationalization (Bieger, 2000). Nevertheless, the fundamental tool of destination management is the strategy of sustainable tourism development. This paper focuses on the application of the above mentioned techniques for managing sustainability in the Czech practice. The research identifies the most used techniques with respect to the impacts induced by tourism development in the destination. Moreover, the research reveals the obstacles to applying certain techniques.

**Purpose:** The reason for running the research is to discover to what extent the Czech destination management organisations (DMOs) reflect sustainability in their destination management. Thus, the research converges to the application of techniques and tools available to sustainable tourism development in practice.

**Design/methodology/approach:** To demonstrate the diversity of tourism impacts on environment, the sample of the research includes the Czech DMOs that are located in different types of destinations (urban, mountain, rural). Questionnaires are used for collecting data. Firstly, DMOs assess the social, economic and environmental impacts that occur in their destination. Then they identify these techniques and tools that they apply to eliminate the impacts. And furthermore, DMOs state the reason why they do not use a certain technique or tool. The gathered data are processed by statistical methods.

**Findings:** The key finding is that the most used visitor management technique is information signing. Development strategy and monitoring of customers' satisfaction are done in partnership. A positive result is that DMOs are willing to cooperate with impacts initiators to improve the situation in the destination. The major obstacle is the lack of financial resources for applying certain techniques. DMOs also argue that there is strong unwillingness of entrepreneurs to participate in sustainable tourism development.

**Research limitations:** The results can be influenced by the subjective perception of the DMOs representatives when assessing destination impacts and used techniques for managing sustainability in their destination. Another limitation is timing. The results demonstrate the situation before the COVID-19 pandemic.

**Practical implications:** Regardless of the COVID-19 pandemic, DMOs can take advantage of the research to update their destination strategies and improve their development processes. Moreover, tourism policy authorities can consider the identified obstacles to the application of a certain technique in their planning process and their incentives.

**Key words:** destination management, impacts of tourism, managing techniques in sustainable tourism, sustainable development

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## Introduction

The issue of sustainability in the context of destination management has been discussed for many years. Ritchie and Crouch (2006) point out that both competitiveness and sustainability are important for destination management.

Practice shows that knowing the concept of sustainability is one thing and applying it is another. In most cases, it is a concept "on paper". What is missing is an awareness of the seriousness of the situation. In doing so, destinations face various economic, socio-cultural, and environmental influences linked to the implementation and development of tourism. In particular, the COVID-19 pandemic showed how some destinations were overburdened by tourism (e.g. urban destinations - cities) and, on the contrary, rural destinations, due to limited cross-border movement of people, started to be sought after and enormously burdened during the COVID-19 pandemic. The awareness of such situation is the first step towards putting the issue of sustainability on the agenda, however the action is essential.

It is therefore appropriate to use various methods and techniques of sustainable tourism to address the negative impacts of tourism. Some authors (Hall & Page, 2006; Ritchie & Crouch, 2006) call for an integrated approach to managing resources in a destination. Therefore, it is the task of destination management to consider this into its process.

This article aims to map the situation of managing sustainability in destinations in the Czech Republic. The reason for conducting this research is to discover to what extent the Czech destination management organisations (DMOs) reflect sustainability in their destination management. The research thus converges on the application of techniques and methods available for the development of sustainable tourism in practice.

## Research Background

The aim of destination management is to deploy resources to be competitive, and to steward destination resources to be sustainable (Ritchie & Crouch, 2006). The former is about the ability to compete in the tourism market, and the latter is about the ability to maintain the quality of physical, social, cultural and environmental resources while compete in the tourism market.

The quality of a destination's resources is influenced by tourism-induced activities. According to the DPSIR model (Pásková, 2009), pressure is exerted on resources, which is reflected in the change in their condition. This creates positive and negative impacts in a destination respectively. It is then the responsibility of policy authorities or DMOs to respond.

Concerning destination management, an overview of tourism sustainability tools is provided by Mowforth and Munt (2009) a Shaw and Williams (2002), see *Table 1* below. Certain parallels are evident in the authors, e. g. environmental impact assessment, carrying capacity calculations, limits of acceptable change, area protection or visitor management. In general, to maintain the sustainability of

resources, destination management uses tools for recreation resource management and for visitor management (Laws, 1995).

**Table 1. Tools and techniques for managing sustainability**

Mowforth and Munt (2009//1998)	Shaw and Williams (2002)	Visitor management // Laws (1995)
<ul style="list-style-type: none"> <li>• Protection of territory</li> <li>• Industry regulation</li> <li>• Visitor Management</li> <li>• Environmental Impact Assessment (EIA)</li> <li>• Carrying capacity</li> <li>• Consultation and participation techniques</li> <li>• Codes</li> <li>• Sustainability indicators</li> <li>• Footprinting and carbon budget analysis</li> <li>• Fair trade in tourism</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Impact Assessment (EIA)</li> <li>• Visitor Management</li> <li>• Carrying capacity</li> <li>• Limits of Acceptable change</li> <li>• Protection of territory</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of customer satisfaction</li> <li>• Monitoring of residents satisfaction</li> <li>• Monitoring of stakeholder satisfaction</li> <li>• Price policy</li> <li>• Accessible management</li> <li>• Information signing</li> <li>• Zoning</li> <li>• Visitor centres</li> <li>• Ethic codes</li> <li>• Education programmes</li> </ul>

Source: Author's own processing based on Mowforth and Munt (2009), Shaw and Williams (2002) and Laws (1995)

Tourism is the source of many negative externalities. In this context, Bieger (2000) calls for the internationalization of externalities. Thus, the cooperation with stakeholders is another technique ensuring the sustainability of destination resources. Bieger (2000) distinguishes two types of cooperation. The one considers cooperation with impacts initiators. And the other type includes the cooperation with impacts eliminators.

With regard to tourism planning, the fundamental tool of destination management is the strategy of sustainable tourism development. This strategy is an agenda that should turn words into action. Thus, DMOs show their responsibility for the sustainable way of tourism development in their destination. Mihalić (2016) comes up with a new collocation “responsustable” – to be both responsible and sustainable.

Nevertheless, the complexity in tourism policy (Farsari, Butler, & Szivas, 2011) and the integrated approach to development (Hall & Page, 2006) from the perspective of DMOs encourage the sustainability of tourism development in a destination.

The paper deals with the application of the above-mentioned techniques for managing sustainability in the Czech practice. The research identifies (the most) used techniques of sustainable tourism with respect to the impacts induced by tourism development in the destination. Moreover, the paper reveals the obstacles to

applying certain techniques; comments the findings in the context of the situation in the Czech Republic; and emphasizes the limitations or the potential transformation challenges for tourism policy and/or DMOs.

## Methodology

The research focuses on sustainability and destination management. Tools and techniques of sustainable tourism applied in destination management are the focus of this research. It is a case study of the Czech Republic, mainly based on the quantitative research supplemented by qualitative comments of the Czech DMOs. A questionnaire was used for data collection, which included both open and closed questions. The questionnaire was in electronic form and was distributed via email.

The research was held before the COVID-19 pandemic. At that time, there was an intensive certification of DMOs by the national tourism authority - CzechTourism. The number of DMOs was floating. According to a 2014 database (Holešinská, 2019), there were 45 DMOs operating in the Czech Republic. These were contacted. Gradually, the number of DMOs increased to 64. However, new DMOs were not included in the research due to their short time of existence and presumed lack of experience with destination management, more precisely with managing sustainability. DMOs were divided into three groups according to the type of destination that they maintain, such as a urban type, mountain type and rural type. This division enables to demonstrate the diversity of tourism impacts on environment in each type of destination.

The return rate of the questionnaires is 26.67 %. Concerning the chosen method of data collection (email), it is the standard rate. Tested data sample includes 5 DMOs – urban destination type, 5 DMOs – mountain destination type, and 2 DMOs – rural destination type.

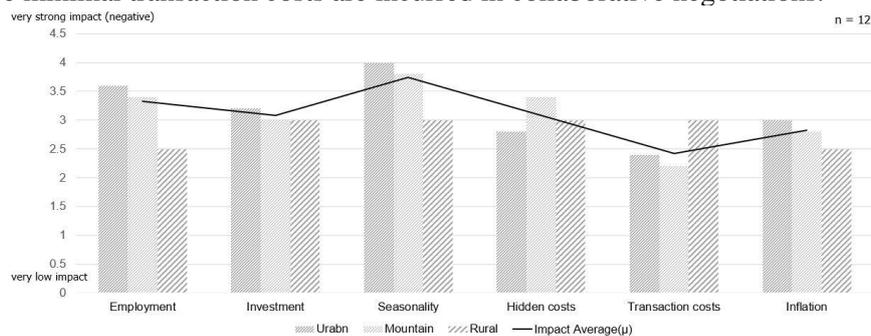
The questionnaire was formulated with the following research objective: “to identify the most used techniques of sustainable tourism with respect to the impacts induced by tourism development in the destination”. Firstly, DMOs assessed the social, economic and environmental impacts that occur in their destination. Then they identified these techniques and tools that they applied to eliminate the impacts. DMOs commented on whether they were actually implementing the technique/tool and whether they were doing so independently or in collaboration. If DMOs do not implement the technique in question. They were simultaneously asked whether they considered to apply the technique in the future or whether they tried but there was some obstacle. And furthermore, DMOs stated the reason why they did not use a certain technique or tool.

The gathered quantitative data were processed by statistical methods. The self-evaluation of tourism impacts in a destination is measured by average and visualized in graphs. Concerning the applied techniques and tools, the correlation was tested to identify whether there was an implication between the assessed impacts and used tools. The qualitative data from the open questions were processed by the interpretative phenomenological analysis to determine the obstacles and comment the results.

## Results and discussion

### Self-evaluation of tourism impacts in a destination

First, DMOs assessed the economic impacts of tourism in a destination. They commented on employment in tourism, investment in tourism, seasonality, hidden costs, transaction costs and inflation, see *Figure 1* below. DMOs in the urban type of destination perceived seasonality ( $\mu = 4$ ) as a key economic impact on the destination. Employment in tourism and investment is also above average. The urban type also experiences inflation, which is logical due to the high concentration of demand in a relatively small area. Transaction costs are rather lower. Hidden costs are below average, which are the lowest of the three destination types, due to the high concentration of infrastructure and services in a small area. In contrast, the highest hidden costs ( $\mu = 3.4$ ) are shown by DMOs of the mountain type. The explanation is that the infrastructure and its capacity in mountain locations is limited by natural conditions, which is why hidden costs are more visible. On the other hand, transaction costs have a low (even compared to other types of destinations) economic impact. Experience shows (Novotná & Holešinská, 2019) that stakeholders in mountain areas form a stronger cohesive community. The opposite is true for urban and rural type of destinations. Whereas, in rural areas stakeholders are distant from each other not only spatially, but also physically. In urban areas, tourism demand is so high that stakeholders are not forced to collaborate (to fight for customers), and hence minimal transaction costs are incurred in collaborative negotiations.



**Figure 1. Self-evaluation: Economic impacts of tourism in a destination**

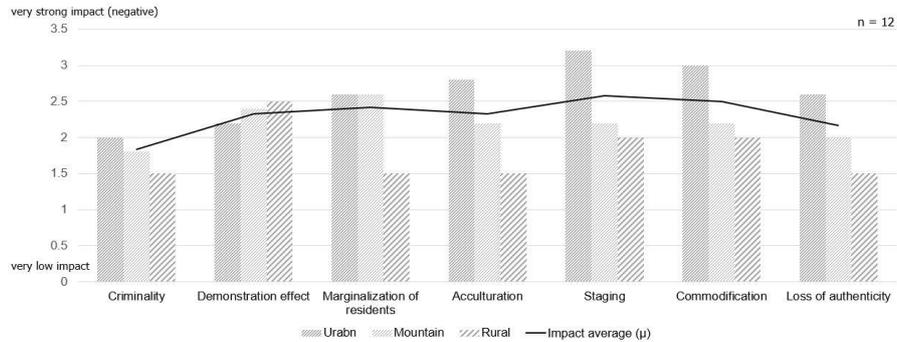
Source: Author's own processing

Concerning the social-cultural impacts of tourism in a destination, such as criminality, demonstration effect, marginalization of residents, acculturation, staging, commodification and loss of authenticity (*Figure 2*), are most evident in the urban type of destinations. Staging dominates ( $\mu = 3.2$ ) - the purposeful display of traditions or customs of the local community. Commodification is another impact that is visible in urban type of destination.

It is worth noting the impact assessment of marginalization of residents, which in the comparison of destinations shows up significantly for the urban type and

mountain, which is closely related to whether the stakeholder providing the tourism service is also a resident. In the urbanized destinations and most mountain tourist resorts, the owners of key facilities or attractions are not local residents. (Novotná & Holešinská, 2019) This is also why there are numerous disputes between locals and stakeholders that are not based in the destination.

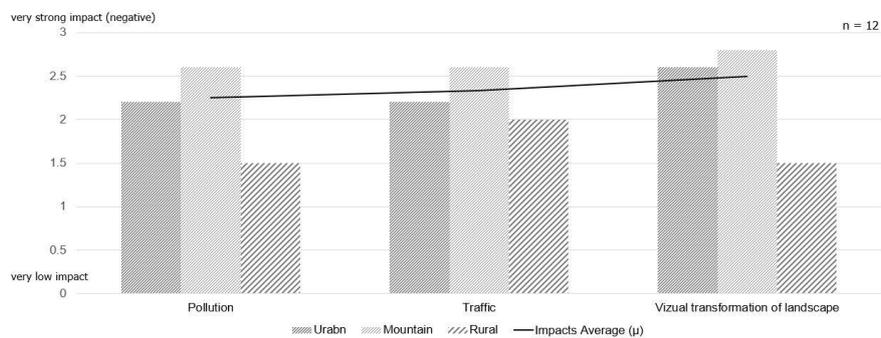
DMOs belonging to the rural type of destination perceive that the overall socio-cultural impacts of tourism to be low. The only impact they feel more strongly than the urban and mountain type of destinations is the demonstration effect, where residents imitate the behaviour of visitors.



**Figure 2. Self-evaluation: Social-cultural impacts of tourism in a destination**

Source: Author’s own processing

The evaluation of DMOs shows that the environmental impacts of tourism (e.g. pollution, traffic, visual transformation of landscape) are most evident in the mountain type of destinations. At the same time, environmental impacts are lowest in the rural areas (Figure 3).



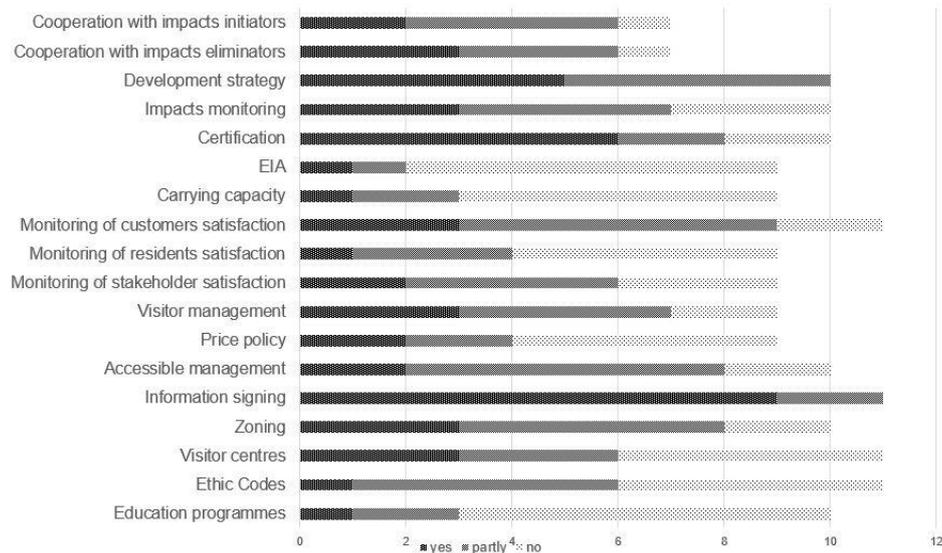
**Figure 3. Self-evaluation: Environmental impacts of tourism in a destination**

Source: Author’s own processing

**Applied techniques and tools for managing sustainability**

A key finding was what techniques and tools DMOs used to stimulate sustainable tourism development in a destination, see Figure 4 below. Most DMOs reported

using information signing. These are mainly the urban and mountain type of destinations. The second most frequently used tool is the development strategy, which half of DMOs are working on. DMOs operating in the mountain areas create their own development strategy. For most DMOs, partnership is important in implementing monitoring of customer satisfaction. Cooperation is also important for DMOs in the case of access management and zoning. In contrast, certification is mostly carried out by DMOs independently.



**Figure 4. Frequency of used techniques and tools**

Source: Author's own processing

More than half of DMOs do not use the EIA (Environmental Impact Assessment) and carrying capacity tool. The lack of experience with these tools is cited as a reason. Half of the DMOs do not use the tools at all to guide visitor behaviour through the Ethic codes and similarly Education programs are not used by DMOs to eliminate (prevent) negative impacts of tourism.

A third of DMOs indicated (especially the urban and mountain type of destinations) that they are willing to work with impact initiators. In general, DMOs from the mountain type of destinations are more willing to apply these tools in destination management. This fact corresponds to some extent with the results of the self-evaluation of impacts.

Unfortunately, the correlation of the individual impacts and the corresponding techniques/tools did not reveal any significant dependence,  $r = <-0,61; 0,69 >$ . Therefore, it cannot be proved that the identified impacts are the reason for the implemented tools.

### **Obstacles for applying techniques**

The major obstacle is the lack of financial resources for applying certain techniques. DMOs also argue that there is strong unwillingness of entrepreneurs to participate in the sustainable tourism development. Especially in the cases of cooperation, both with impacts initiators and with impacts eliminators. One DMO even reported that it had tried to implement monitoring of stakeholder's satisfaction but had encountered reluctance from the stakeholders themselves. This finding is related to trust among stakeholders (Holešinská, 2013; Novotná & Holešinská, 2019).

One of the other barriers to DMOs not implementing a cooperation strategy to eliminate externalities, is the lack of support from the public sector. In addition to the lack of support for cooperation to eliminate externalities, DMOs reported that they generally lacked the setting of appropriate conditions for DMOs to operate within tourism policy. (Holesinska, 2019)

### **Conclusion**

Concerning the impacts of tourism in a destination evaluated by DMOs themselves, economic impacts are variable and manifest themselves differently in different types of destinations. In general, seasonality is a key impact. The evaluation showed that socio-cultural impacts were more evident in the urban type of destinations. In contrast, environmental impacts are dominant in the mountain type of destinations. These findings need to be studied and appropriately implemented in strategic planning for sustainable tourism development in the destination.

The research identified the most used techniques of managing sustainability (information signing, development strategy, monitoring of customers satisfaction). Basically, these are visitor management tools. The key is in applying specific partnership techniques. Furthermore, the research found a very low dependency between the variables (impacts and techniques applied). This shows the inconsistency of sustainable development and the weakness of destination management to manage destination resources in a way that is sustainable. Despite the fact that a number of DMOs have indicated their willingness to implement these techniques, there are barriers in the form of lack of financial resources, mistrust among stakeholders and lack of support from tourism policy.

Sustainable tourism development is not the priority for the Czech tourism policy. There is no incentive to support the issue. Therefore, sustainability is up to DMOs themselves. However, they are faced with limited budgets (Holešinská, 2013) and with missing experience in the field of sustainability. If one adds to this the lack of awareness and responsibility from the community perspective, then s/he gets a comprehensive picture of how much the Czech DMOs reflect sustainability in their destination management.

Leaving aside the possibility of bias in the results due to the subjective perception of the DMOs representatives when assessing destination impacts and used techniques for managing sustainability in their destination, as well as due to the

COVID-19 pandemic, the situation calls for transformation. First of all, the Czech tourism policy needs to change its approach to be complex and to clearly set its priorities. The first priority should therefore be “to be responsible and sustainable” which means to be ‘responsustable’ (Mihalić, 2016). Hand in hand with this, the Czech DMOs should change the form of traditional patterns in local communities through active communication, education via marketing, active cooperation (projects supporting sustainability). Regardless of the COVID-19 pandemic, DMOs can take advantage of the research to update their destination strategies and improve their development processes. Moreover, tourism policy authorities can consider the identified obstacles to the application of a certain technique in their planning process and their incentives.

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# RESEARCH ON GREEN LOGISTICS AND BUSINESS PROCESS MANAGEMENT IN THE CIRCULAR ECONOMY CONTEXT

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## Abstract:

**Purpose:** The coordination between green logistics activities and efficient business processes management is an extremely urgent task for the sustainable development of the Vietnamese economy in general as well as the logistics industry particularly. The main aim of this research is to propose an integrated research framework for green logistics (GL) and business process management (BPM) in the context of circular economy (CE) for the Vietnam logistics industry.

**Design/methodology/approach:** Both qualitative and quantitative methods are used in two stages. A qualitative methodology is used in the first stage to develop a literature review on green logistics business processes and circular economics. In the second stage, the research proposes a conceptual framework of green logistics and business process management in the circular economy context. An evaluation indicator system is also developed based on the proposed framework, including three levels of circular economy and eight indicators of logistics activities that can be applied in the Vietnam industry. The quantitative method is used to evaluate the proposed framework by using the Analytical Hierarchy Process.

**Findings:** The research contribution is to produce a literacy on green logistics and business processes in the context of circular economy, and then propose a theoretical framework and its evaluation index system for green logistics development in Vietnam. Based on this framework, a future research agenda is outlined to evaluate green logistics practices in Vietnam.

**Research limitations:** Firstly, the study deals with data access problems primarily in SME case studies in Vietnam. Finally, since the scope of the study is focused on the logistics industry, there may be other Vietnam industry indicators in the Analytical Hierarchy Process (AHP) evaluation system that affect green activities that have been overlooked.

**Social implications:** The research framework benefits Vietnam's logistics enterprises that can predict future development trends to enable logistics stakeholders for understanding the status quo as well as improving the controlling's efficiency and effectiveness of government departments to reduce the gaps in developed countries. It also contributes to developing consuming behavior in the light of the circular economy context.

**Keywords:** Analytical Hierarchy Process, Business Process Management, Circular Economy, Green Logistics.

## Introduction

### Motivation

Vietnam opened its logistics market in 2014 according to its commitments with the World Trade Organization (WTO). The number of Vietnamese companies participating in the logistics industry has grown significantly, and the

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professionalism of service providers is more demanding. According to estimates from the Vietnam Logistics Research and Development Institute (VLI), the market currently has more than 3000 companies operating in the logistics field in general and needs more than 200,000 employees by 2030. The ability, however, to meet the needs of the logistics workforce is only about 10% of the demand (Vietnam Logistics Research and Development Institute, 2019).

Speaking during the High-Level Dialogue of the Circular Economy in Emerging Markets Webinar, Minister of Natural Resources and Environment, Tran Hong Ha, said: "The economic transition towards a circular economy, a green economy, and a low-carbon economy is an inevitable trend of the times, with consensus globally and is considered by countries around the world as the green industrial revolution of the 21<sup>st</sup> century, aiming to develop sustainable development". The Vietnamese government is trying to minimize the impact of economic growth on environmental and social issues. Green and sustainable development strategies and models have begun to receive special attention.

The Vietnam Business Forum estimates that Vietnam's total logistics costs are approximately three times higher than those of the United States and Japan, ranging from 20.9% to 25% of GDP (Figure 1).



**Figure 1. Logistics Cost Comparison**

Source: Logistics4VN (2015)

The Prime Minister of Vietnam has also approved the overall strategy for the development of Vietnam's service sector (Decision No. 175/QD/TTG), which makes logistics services a key factor in promoting the development of distribution systems for other services as well as for the circulation of goods and materials. The logistics market is estimated to grow 20-25% per year, and the proportion of outsourced logistics reaches 40%.

Therefore, for the sustainable development of Vietnam's industry in general, as well as the improvement of business processes in particular, green logistics activities are the key driving factors that must be considered. Thus, it can be affirmed that the motivation for the research is focused on interesting areas such as green logistics, business process management, and circular economy.

### **Problem statement**

It can be affirmed that the Vietnam government has seen the role of sustainable and green development and has made efforts to establish general strategies and approaches. However, the policies and implementation mechanisms in Vietnam are not yet clear, and there are still many limitations in the implementation process. Currently, the Vietnam logistics industry is still using old and outdated technology that consumes a lot of energy, so it is a great challenge to use high-tech applications and modern business process management to adopt the context of the circular economy. Awareness and understanding of a circular economy in Vietnam are still a challenge, it is necessary to continue conducting research and spreading knowledge widely among policymakers, businessmen, and people. To implement Vietnamese logistics and business processes with a 'green and sustainable' mindset in the context of a circular economy, the following should be noted: (1) transformation of new technology and strengthens business process management; (2) construction of synchronous infrastructure; and (3) development of government policies, legal and standards, as well as an education and training plan to change thinking, behavior and operations of organizations in a green and sustainable mindset.

There is a need for a better understanding of the integrated framework of GL and BPM in the CE context, aiming to satisfy multiple objectives of society, economy, and environment. The study topic, namely, 'Research on green logistics and business process management in the context of the circular economy for the Vietnam logistics industry'. Based on this, the study has developed the following set of questions (RQs):

- RQ1. What GL, CE, and BPM are?
- RQ2. Why has green logistics become a mandatory trend in the world?
- RQ3. How to develop an integration of GL and BPM in the CE framework?

### **Research objectives**

The main aim of the research is to propose an integrated framework for green logistics (GL) and business process management (BPM) in the context of a circular economy (CE).

In the light of a green and sustainable mindset applied to Vietnam's logistics sector, the research details the following objectives (ROs):

- RO1. Develop literacy for GL, BPM, and CE.

RO2. Propose an integrated research framework and an evaluation indicator system for GL & BPM in the CE context.

RO3. Outlines future research agenda by using the AHP technique.

## **Literature review**

### **Literature review process**

To develop this section, some keywords are used such as ‘CE’, ‘GL’, ‘BPM’, ‘sustainability + GL’, ‘AHP + GL’, etc. Some of the Q1 or Q2 articles are downloaded from high-quality journals selected from Google Scholar and Web of Science, including Resources, Conservation & Recycling; Business: Theory and Practice; Annals of Operations Research; Journal of Business Research; International Journal of Organizational Analysis; and Journal of Cleaner production; etc.

The keyword search led to a set of 168 articles, after removing 103 articles due to title, language, duplicates, publication years, and considering on SJR of Q1 or Q2, 65 articles are selected and continued for abstract review, and acceptance of 24 articles is made, the cross-reference resources contributed more 05 articles. This research is referred to a total of 29 articles.

### **Related materials**

Jouni Korhonen, Honkasalo, and Seppälä (2018) contributed to the scientific research on CE. Recently, the Ellen McArthur Foundation argued that CE as an industrial ecosystem to utilize production-consumption systems based on the principles of reduce-reuse-recycle (3Rs) to balance the three pillars of sustainability such as economic, social and environmental perspectives. (Macarthur, 2020; Patwa *et al.*, 2021). That same year, Piero Morsetto (2020) developed a 10R framework to elaborate on the selected circular economy targets. One year later, Nitin Patwa *et al.* (2021) investigated the adoption of CE principles among emerging economies in three aspects such as enterprise, consumer, and government in line with CE principles.

There are many studies on the relationship between BPM, CE, GL, and sustainability (Chen, Jiang, and Wang, 2011; Nowak, Leymann, and Schumm, 2011; Moreno *et al.*, 2016; Geissdoerfer *et al.*, 2017; Karaman, Kilic, and Uyar, 2020; Islam *et al.*, 2021), such as Abdullah S. Karaman *et al.* (2020) proved the closed relationships between green logistics performance with the number of sustainability reports within logistics field. Geissdoerfer *et al.* (2017) provided the relationships of circular economy and sustainability by synthesizing the similarities, differences, and relationships between them. In addition, Oksana Seroka-Stolka and Agnieszka Ociepa-Kubicka (2019) examined the concept and relationship of green logistics in

a circular economy system. Nowak *et al.* (2011) investigated and identified the differences in green BPM compared to conventional BPM. Some years later, David Tucek (2015) described the main reasons for BPM implementation in Czech companies. Chen *et al.* (2011) analyzed the business process functions of green logistics. While Pravin Kumar *et al.* (2021), through reviews of the literature and expert opinion, identified key criteria and barriers that have been solved to meet sustainable goals. It develops an integrated strategy that promotes sustainable practices through circular economics and industry 4.0 applications.

### **Related methods**

The next discussion will focus on the development of mathematical models and techniques for the challenges in logistics operations, especially the focus on high-tech applications for GL, BPM, and CE. Mathematical programming and heuristic approaches using multiobjective optimization were proposed to deal with GL, BPM problems in the CE context. For example, Alperen Bal & Badurdeen (2020) presented an MCDM facility location to achieve efficiency by implementing CE. The Internet of Things (IoT) and blockchain technologies are widely applied by many researchers (Lopes de Sousa Jabbour *et al.*, 2018; Jabbour *et al.*, 2019; Dubey *et al.*, 2019; Manavalan and Jayakrishna, 2019; Saberi *et al.*, 2019; Bag and Pretorius, 2020; Kouhizadeh, Zhu, and Sarkis, 2020; Tan *et al.*, 2020; Kumar, Singh, and Kumar, 2021), such as Mahtab Kouhizadeh *et al.*, (2020) examined the transformation and realization of a circular economy using blockchain technology. In addition, Alkahtani *et al.* (2018) proved that energy exhaustion minimization reduces environmental impact by adopting high-tech applications in the logistics industry for green operations and living. Nowak *et al.* (2011) proposed using a set of green business process patterns for describing appropriate solutions for the ecological optimization of business processes. In recent years, Yao *et al.* (2020) used a popular machine learning method, namely, FunHDDC, to evaluate the green efficiency of the logistics industry.

The AHP technique is also widely used. For example, Syed Abdul Rehman Khan and Yu Zhang (2021) used the theory of the analytical hierarchy process and comprehensive fuzzy evaluation to construct, quantify and evaluate the development of China's regional green logistics. While Chonmapat Torasa and Witthaya Mekhum (2020) examined the impact of green logistics activities on the circular economy indicators of ASEAN.

### **Research Methodology**

Modern logistics management is the integration of scattered global resources to meet the expanding consumer market and sustainability requirements. The latest trends in logistics operations focus on green and sustainable thinking using

technology-based and IT-based management to minimize environmental impact and optimize operations. A green and sustainable logistics perspective becomes essential for business processes, such as green sourcing of quality raw materials; efficient and green production processing; and effective reverse logistics of reducing, reusing, and recovering cycles. Green logistics is a key factor in the sustainable development of the global economy and the circulation of material flows, namely the adoption of the circular economy.

The research methodology uses both qualitative and quantitative methods in two stages, in which a qualitative methodology is used in the first stage producing a literature review on GL, BPM, and CE models. In the second stage of the research, a conceptual framework is proposed that can be applied in the Vietnam logistics industry. Then an evaluation indicator system is also developed using the AHP technique. A future research agenda is outlined. Quantitative methods are used in future work to quantify and evaluate Vietnam's integration of GL and BPM in the CE context. Data collection for evaluation focuses on surveys, questionnaires, observations, and interviews.

### **Business process**

BPM is defined as the methodology for the evaluation, analysis and improvement of the efficiency and effectiveness of key business processes within an enterprise. The role of researchers or businessmen is to choose what are their key business processes and then to visualize them to easily control and measure the business performance. As can be seen in Figure 1, the research assumes a business process with an upstream stakeholder, namely the marketer and the sellers, and its downstream stakeholders can be defined as customers. Therefore, there are two key business processes:

1. Making or buying
2. Distribution.

### **Green logistics process**

After receiving a purchase order, the sellers will arrange third-party logistics (3PL) to deliver goods to customers. The process includes some forward stakeholders, namely suppliers, distribution centers, retailers; and reverse stakeholders, such as collectors. In the forward and reverse logistics process, stakeholders need to collaborate and coordinate together to optimize their activities and operations and to realize green logistics in the CE context.

As in Figure 1, the key green logistics activities in the integrated framework include eight activities:

1. Green information (green IT)

2. Green procurement
3. Green manufacturing
4. Green transportation
5. Green packaging
6. Green storage
7. Green consumption
8. Reverse logistics (the 5Rs)
  - a. Repair
  - b. Reuse
  - c. Remanufacturing
  - d. Recycling
  - e. Residual waste and renewable resources.

### **Circular economy capabilities**

As in the discussion in previous sections, the research focuses on three aspects in a circular economy context that influence Vietnam's logistics industry and business process:

1. Government aspects: policies, legal, and standards.
2. Enterprise aspects: business process and green logistics model.
3. Customer & Society aspects: training & behavior factors.

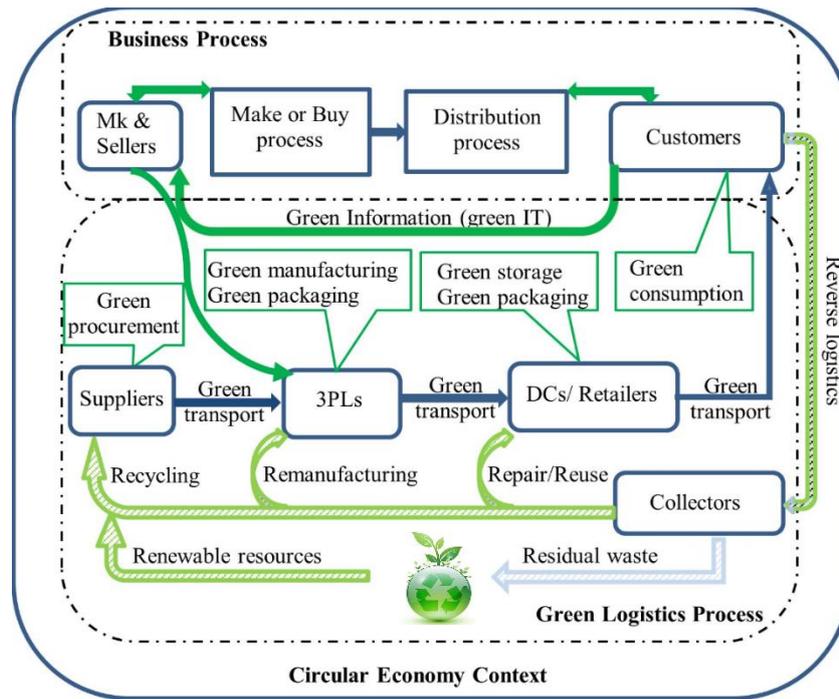
It is desired that the result of the research be outlined in the next section.

## **Research Results**

### **Proposed research framework**

In summary, from the investigation of the literature review and the research methodology, a research framework is proposed. The proposed framework integrates at least two key business processes into eight green logistics operations in the light of the CE context of three aspects including government, enterprise and customers that impact the Vietnam logistics industry along with the mindset of green and sustainable development.

The integrated research framework is described in Figure 2.



**Figure 2. The integrated research framework of GL & BPM in the CE context**

Source: own research

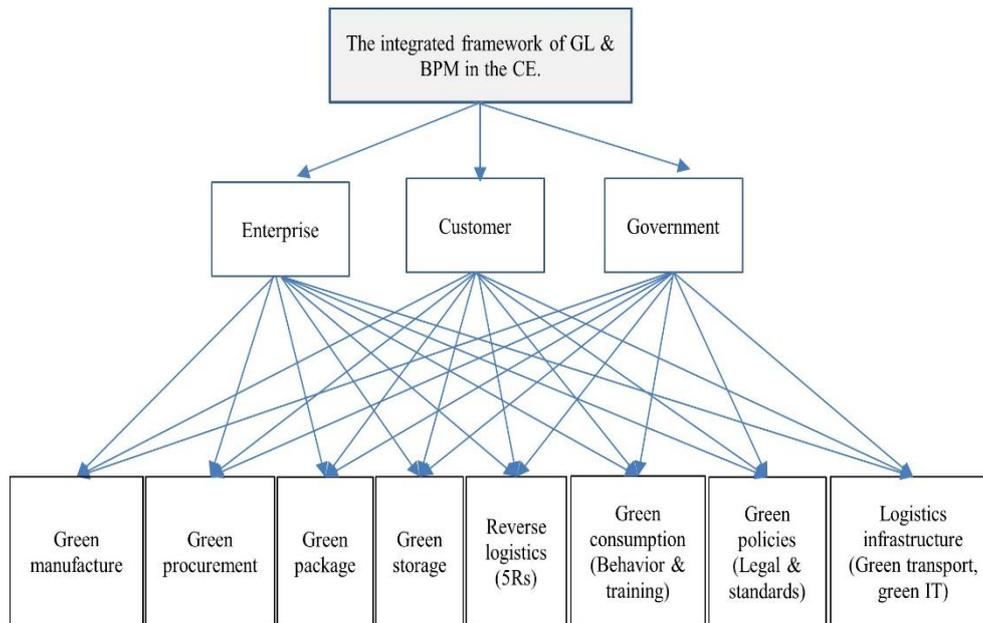
**Evaluation system for the proposed framework**

The evaluation activity is a goal-driven activity based on the AHP technique developed by Thomas L. Saaty (1980). It uses pairwise comparisons, computes the weighting factors, and makes evaluations. The research also suggests an evaluation matrix that uses the above framework.

The overall level describes the integration framework of GL and BPM in the CE model. The middle level of the hierarchy describes three aspects from the government, enterprise, and customer levels. The low level of the decision hierarchy shows the indicator systems. The proposed indicator systems improve the overall greenness of logistics and BPM integration in the context of CE.

The indicator systems at the low level in the hierarchy were formed from three middle levels in which the enterprise level includes green manufacturing; green procurement; green packaging; green storage, and reverse logistics. The customer level represents green consumption. And the government level represents the green policies and logistics infrastructure, including green transportation and green IT.

The evaluation results will be presented in future research to identify potential green logistics activities and improve them in the CE context to improve the Vietnam logistics industry and the Vietnam economy in general (Figure 3).



**Figure 3.** *The evaluation index system for the proposed framework*

Source: own research

## Discussion

### Theoretical implications

The contribution of the research is to propose a theoretical framework of GL & BPM in the context of CE that adopts the Vietnam logistics industry (Fig. 2). Based on this proposed framework, it extends a future research agenda for evaluation by using the AHP technique (Fig. 3).

### Practical implications

The research framework benefits Vietnam's logistics enterprise that can predict future development trends to allow relevant stakeholders to grasp the status quo as well as improve the efficiency and effectiveness of government departments to reduce gaps in developed countries. It also contributes to developing consuming behavior in the light of the CE context.

### Limitations

Firstly, the study is coped with problems in data accessing of SME case studies in Vietnam. Finally, since the scope of the study is focused on the logistics industry, there may be other indicators of the Vietnam industry that may affect green activities that have been overlooked.

## Conclusions

This study produces a literature review and proposes an integrated research framework of GL & BPM in the CE context. This proposed framework is also investigated at the hierarchy level with three main factors, including government, enterprise, and customer level. It also elaborates on the eight-indicators evaluation system, which includes green manufacturing, green procurement, green packaging, green storage, reverse logistics, logistics infrastructure, green consumption, and green policies.

As a result, a future research agenda is also proposed to use the AHP technique to evaluate the integrated research framework in the light of CE capabilities that impact the Vietnam logistics industry along with the mindset of green and sustainable development.

Therefore, the assessment of the management of the green logistics business process based on the circular economy context can be adopted in Vietnam. The Analytical Hierarchy Process is used. Quantitative analysis of the evaluation indicator system for the development of green logistics will help all sectors to have a comprehensive understanding of green logistics activities and thus promote the efficiency and effectiveness of green logistics in Vietnam.

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