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Challenges of Nowadays in the Light of Sustainability

8th VUA YOUTH Scientific Session

Conference proceedings

26 November 2021, Gödöllő, Hungary

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Contents

Comparative Analysis of EU Countries from Selected Aspects of Sustainable Development

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Abstract
The aim of the presented paper is to compare EU countries in terms of analyzing selected sustainable development indicators. We evaluate 16 indicators representing 9 thematic areas of sustainable development, namely poverty and social exclusion, health, education, employment, research and development, economic development, climate change and energy, transport, and global partnership. The data are collected from Eurostat for year 2018. Original values of indicators are adjusted in the same direction and standardized. We assess European Union countries' positions by aggregating 16 indicators into one integral indicator. First approach uses the weights of indicators, that are calculated on the base of correlation matrix. Secondly, through weighting indicators by partial correlation coefficients in each iteration step (I-distance method). Based on the final aggregated indicators from both approaches we rank countries and divide them into groups using the three-sigma rule. The final rankings of the countries determined by both approaches are highly significantly correlated. In terms of the examined indicators, the study shows that Northern Europe countries get the best outcomes in meeting the goals of sustainable development. They are followed by Western European countries, which, due to their industrialization, obtain less satisfactory results in terms of the usage of renewable energy in final energy consumption and greenhouse gas emissions. The Southern and Eastern Europe countries, including Slovakia, are ranked in the lowest positions among other member countries in terms of meeting the goals of sustainable development. When compared to the European Union average, Slovakia has the lowest rate of poverty and social exclusion. However, significant challenges remain according to indicators of lifelong learning, official development assistance, research and development expenditures, GDP level, energy productivity and consumption of renewable energy sources.

Keywords: *correlation matrix, European Union, I-distance, sustainable development, weighting variables*

JEL Classification: *C39, Q01, Q56*

1. Introduction

Sustainable development is a topic, that has become a global issue due to economic and environmental challenges in the second part of the twentieth century. Countries has gradually realized that their economic progress has a substantial impact on the environment and social balance. It was necessary to start looking for a long-term strategy combining economic and social development with a focus on environmental protection. Todaro and Smith (2011) defines sustainable development in their publication as a multidimensional process that includes major changes in social structures, attitudes, and institutions, as well as economic growth, reducing inequality reduction, and poverty eradication. According to Georgescu and Herman (2019), national and international strategies should pay attention to sustainability but also to the inclusive development to ensure a high standard of living and quality of life for all people.

In addition to the EU Sustainable Development Strategy the sustainable development is integrated into EU policies and legislation through the Europe 2020 Strategy. The Europe 2020 Strategy was proposed in 2010 by European Commission for the period 2010-2020 to overcome the global economic and financial crisis, and emphasizes the need for increase in economic cooperation to address the causes of the crisis and promote sustainable growth in the EU, (Bongardt & Torres, 2010).

1.1. Monitoring the sustainable development

Sustainable development can be measured and evaluated through set of indicators that reflect the Agenda's 2030 goals, as well as through aggregated indicators. It is a multidimensional concept, consisting of social, economic, environmental, and institutional pillars. According to Spanberger (2002), indicators can be helpful with a simpler description of reality, identification of major issues that must be addressed, and with the development of appropriate solutions to meet sustainable development goals. These objectives should be quantifiable, or at very least specified in the direction of achieving long-term progress. Empirical research of Gupta and Vegelin (2016) points out that achieving sustainable development can affect economic growth at the cost of negative affecting social well-being and ecological viability. The social pillar of sustainable development consists of topics such as poverty, health care, education, or demography. People at risk of poverty or social exclusion, life expectancy at birth, mortality rate, tertiary education, or population growth are examples of indicators, which monitor the given social topics according to Janković Šoja, Anokić, Bucalo Jelić and Maletić (2016).

Fiorino (2011) states that there is no set of national environmental indicators that can be compared with a standard set of economic performance indicators. The most comprehensive set of sustainable development indicators is according to Wilson, Tyedmers and Pelot (2007) included in the Environmental Performance Index (EPI). However, this index captures the concept of environmental development rather than its specific components, which are pollution, energy consumption and soil degradation. The authors alto point to a similar shortcoming in the indicators of sustainable development, that has the effect that economic activities carried out based on the sustainable development principles often continue to threaten the environmental integrity of locality. The last assessment of the countries according to EPI 2020 is described in Thiessen (2020) research. The most recent EPI score considers statistics on air and water quality, waste management, CO_2 emissions, and other public health concerns. The top ten places with the highest score were all in European countries, including Denmark, Luxembourg, Switzerland, the United Kingdom, France, Austria, Finland, Sweden, and Norway. According to Olafsson (2014), a variety of different indices are used to analyze environmental sustainability in addition to the EPI index as the Ecological Footprint (EF) and Happy Planet Index (HPI). Kubiszewski (2013) added that HPI was developed after recognizing that GDP per capita statistics are incorrect from assessing national human well-being because they do not consider the environmental costs of economic activity and tend to grow due to negative externalities such as environmental pollution or loss of national resources.

Janković Šoja et al. (2016) analysed in their research the sustainable development in EU countries for year 013 through I-distance method of weighting the indicators. According to authors, there is a need for constant monitoring sustainable development indicators at national and international level due to continuous population growth on the one hand and limited natural resources and food supplies on the opposite side. In their research, the EU countries are ranked according to their individual level of achievement of the national sustainable development objectives. The results show that Luxembourg is ranked as the country with best results

and is followed by other northern European countries such as Sweden, Finland, Netherlands, and Denmark. Romania, Bulgaria, Lithuania, Latvia, Croatia, and Hungary are less successful countries in achieving the objectives of sustainable development. Based on the above results, the authors state that less successful countries should follow the example of Luxembourg or other Scandinavian countries to be able to improve their social systems. This could potentially lead to an increase in quality of life and general well-being of the state.

2. Data and Methods

The data base of the research paper is collected from Eurostat for year 2018. We compare EU countries according to the 16 selected indicators of sustainable development based on Agenda 2030. Namely, people at risk of poverty or social exclusion, life expectancy at birth, rate of employment, employment of recent graduates, early school leavers, early childhood education, tertiary education attainment, lifelong learning, GDP per capita, research and development expenditures, renewable energy sources consumption, greenhouse gas emissions, emissions of CO_2 from new passenger cars, number of deaths caused by road accidents, energy efficiency and official development assistance. To fulfil the set goals, we aggregate all indicators into one integral indicator through two approaches. Indicators are adjusted in the same positive direction by multiplying the negative indicators by a coefficient of -1 and standardised using the following expression:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{s_{xj}} \tag{1}$$

for i=1...n and j=1...k. Where n is the number of countries, k is the number of indicators, z_{ij} is the standardised value of observed indicators, x_{ij} is the value of observed indicators, $\bar{x}_j$ is the arithmetic mean of observed indicators and s_{xj} is the standard deviation of observed indicators.

First approach uses the weights of indicators, that are calculated on the base of correlation matrix. We calculate the weights using the following expression:

$$v_j = \frac{\left|\sum_{i=1}^{k} r_{ij}\right|}{\sum_{j=1}^{k}\left|\sum_{i=1}^{k} r_{ij}\right|} \tag{2}$$

for i, j = 1...k. Where k is the number of indicators, v_j is the weight of the observed indicators, and r_{ij} is the paired correlation coefficient between observed indicators. Final aggregated indicator for each country is calculated using the following expression:

$$d_{1i} = \frac{1}{k}\sum_{j=1}^{k} z_{ij} * v_j \tag{3}$$

for i=1...n and j=1...k. Where n is the number of countries, k is the number of indicators, d_{1i} is the aggregated indicator for each country, z_{ij} is the standardised value of the observed indicators and v_j is the weight of the observed indicators.

Second approach (I-distance method) is based on weighting indicators by partial correlation coefficients in each iteration step. This approach allows the evaluation of the countries according to a larger set of indicators. According to the Ivanovič (1963) is for a selected set of

sustainable development indicators $X^T = (X_1, X_2..., X_k)$, the I-squared distance between two indicators $e_r = (x_{1r}, x_{2r}, ..., x_{kr})$ and $e_s = (x_{1s}, x_{2s}, ..., x_{ks})$ is computed using following expression

$$D^2(r,s) = \sum_{i=1}^{k} \frac{d_i^2(r,s)}{\sigma_i^2} \prod_{j=1}^{i-1} (1 - r_{ji.12..j-1}^2) \quad (4)$$

where:

$$d_i(r,s) = x_{ir} - \overline{x_i} \quad (5)$$

represents a discriminatory effect of the indicator x_i of the observed country and the fictional unit x_i, which is defined as maximum values of each indicator. Next, σ_i is standard deviation of indicator X_i and $r_{ji.\ 12..j-1}$ is a partial coefficient of correlation between indicators X_i and X_j. In the first step of I-distance method, we calculate the discriminant effect and then the aggregated indicator. Those variables, that correlate insignificantly with the aggregated indicator are excluded from the analysis in the following iteration steps. Based on the aggregate indicators of sustainable development computed by both approaches, we rank the EU countries from the best to the worst. The strength and direction of the relationship between the rankings is verified by using the nonparametric Spearman's rank correlation coefficient, which is defined as

$$r_s = \frac{6\sum_{i=1}^{n} D_i}{n*(n^2-1)} \quad (6)$$

where n is the number of countries, r_s is the Spearman's rank correlation coefficient and D_i is the difference between the rankings for examined countries.

The three-sigma rule is used in the paper to categorize countries into similar groups according to the computed aggregated indicators (d1, d2). The groups are constructed based on the following intervals: $\mu \pm \sigma$ (68 % of countries), $\mu \pm 2\sigma$ (95 % of countries), $\mu \pm 3\sigma$ (99,7 % of countries).

3. Results

In the presented paper, we assess the European Union countries' position based on the aggregated sustainable development indicators, that are constructed through two approaches. Firstly, by weighting the sustainable development indicators on the base of the correlation matrix. Secondly, by weighting the examined indicators by partial correlation coefficients in each iteration step. EU countries are ranked descending based on the acquired aggregated indicators. In next step we divide the countries into similar groups based on the three-sigma rule.

3.1. Weighting the sustainable development indicators on the base of correlation matrix

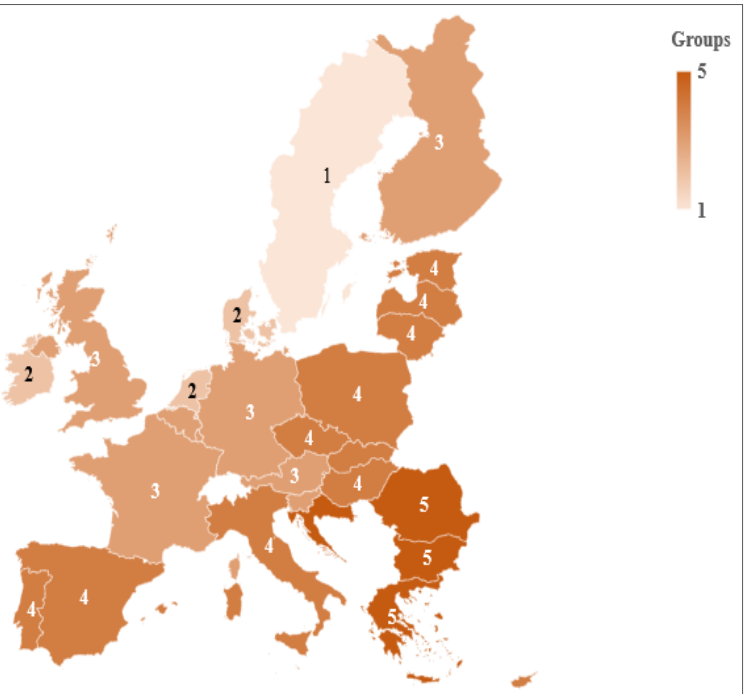
Figure 1 shows the ranking of EU countries based on the aggregated indicators created by weighting all selected sustainable development indicators using a correlation matrix. It demonstrates that the aggregated sustainable development indicators of 13 member states in the first three groups have the highest values. The other 15 member states in the fourth and fifth group, have lower overall performance in meeting the sustainable development goals.

The first group consists of one country, Sweden, which has the best performance among European Union countries in terms of sustainable development goals. Sweden is the EU leader

in employment, adult participation in learning, investment in research and development, renewable energy consumption, and official development assistance. Sweden also emits the fewest greenhouse gas emissions per capita in the European Union. This economically developed country exceeds the EU average also in other analysed indicators.

Figure 1. Ranking of member countries according to their aggregated sustainable development indicators determined by using weights on the base of correlation matrix

Group	Ranking	Country	Aggregated indicator
1	1	Sweden	0,078
2	2	Denmark	0,066
	3	Netherlands	0,045
	4	Ireland	0,041
3	5	United Kingdom	0,035
	6	Luxembourg	0,034
	7	Finland	0,032
	8	Austria	0,031
	9	France	0,029
	10	Germany	0,025
	11	Belgium	0,011
	12	Slovenia	0,009
	13	Malta	0,003
4	14	Spain	-0,005
	15	Portugal	-0,006
	16	Cyprus	-0,008
	17	Czechia	-0,008
	18	Estonia	-0,014
	19	Lithuania	-0,021
	20	Italy	-0,024
	21	Hungary	-0,024
	22	Poland	-0,028
	23	Slovakia	-0,030
	24	Latvia	-0,032
5	25	Croatia	-0,046
	26	Greece	-0,050
	27	Bulgaria	-0,069
	28	Romania	-0,071



Source: author's calculations

Denmark, Netherlands, and Ireland, which make up the second group, are likewise getting closer to meeting the sustainable development goals. The economies of Denmark and Netherlands are advanced, with a high share of GDP per capita. These countries also have high levels of health care and education, as well as a higher consumption of energy from renewable sources. As a result, they manage to obtain exceptional results in practically all the indicators that are examined. However, Ireland has a higher proportion of the population at risk of poverty or social exclusion than the EU average, which is linked to lower employment rates. Ireland also spends less on research and development than the EU average, uses a lower share of renewable energy sources and is one of the top three emitters of greenhouse gases. On the other hand, Ireland is one of the most sustainable developed countries, due to its high level of GDP per capita, which also makes it the most energy efficient EU country.

The third group consists of Western European countries, namely The United Kingdom, followed by Luxembourg, Finland, Austria, France, Germany, Belgium, Slovenia, and Malta. We can state that this group is moving closer to the EU sustainable development goals. These countries also emit more greenhouse gases per capita than the EU average, which is related to their economic development. Luxembourg is the most economically developed country, but it dropped into the third group due to the worse outcomes in terms of road accidents fatality rates, share of renewable energy sources, and due to its greenhouse gas emissions and CO_2 emissions from new passenger cars. Finland is the only Scandinavian country in the third group. It has a smaller proportion of employed recent graduates and is less energy efficient than the EU average, implying that the GDP level is growing slower than the energy consumption.

Slovakia is ranked 23rd and is part of the fourth group of countries, that includes V4 countries, Baltic countries, and Southern European countries. Countries from this group are characterised by lower incomes, poorer education, and health care than the EU average. It is directly linked to the worse social conditions in these countries. The observed countries emit a smaller amount of greenhouse gases per capita on average. However, their economic growth is mostly based on the amount of energy consumed, which is a negative trend for to the environmental sustainability.

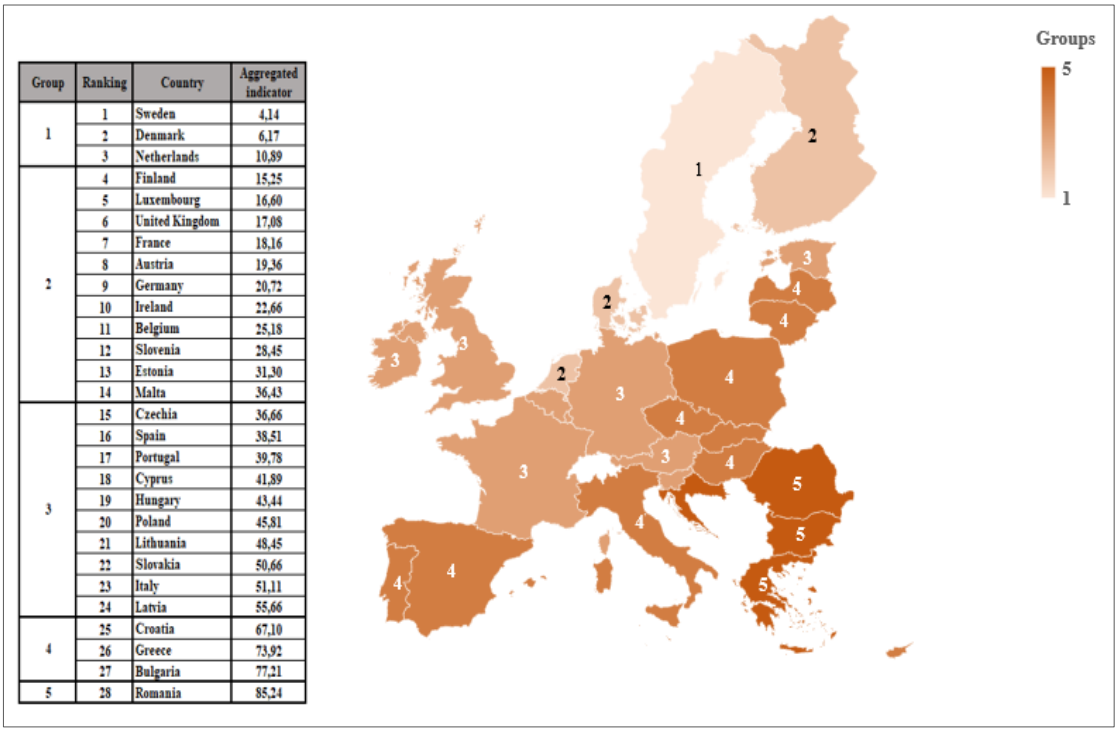
The last group is made up of the worst-performing countries, Croatia, Greece, Bulgaria, and Romania, which have low employment rate, a low level of education, a low GDP rate, and a high proportion of the population at risk of poverty or social exclusion. Even though they produce the least amount of greenhouse gas emissions per capita in the EU, this cannot be considered a beneficial phenomenon given their GDP level. This fact is also supported by a low energy efficiency of these countries.

3.2. Weighting the sustainable development indicators on the base of the partial correlation coefficients

In the second approach, we calculate the aggregated indicator of sustainable development by weighting the variables using partial correlation coefficients and calculating the discriminant effect (I-distance). We gradually eliminate factors that have an insignificant correlation with the resulting aggregated indicator in each iteration step. Namely, early school leavers, consumption of renewable energy sources, greenhouse gas emissions and emissions of CO_2 from new passenger cars. The resulting ranking of countries based on the I-distance approach and their division into group according to the three-sigma rule illustrated Figure 2.

Figure 2. Ranking of member countries according to their aggregated sustainable development indicators determined by using weights on the base of partial correlations

Group	Ranking	Country	Aggregated indicator
1	1	Sweden	4,14
	2	Denmark	6,17
	3	Netherlands	10,89
2	4	Finland	15,25
	5	Luxembourg	16,60
	6	United Kingdom	17,08
	7	France	18,16
	8	Austria	19,36
	9	Germany	20,72
	10	Ireland	22,66
	11	Belgium	25,18
	12	Slovenia	28,45
	13	Estonia	31,30
	14	Malta	36,43
3	15	Czechia	36,66
	16	Spain	38,51
	17	Portugal	39,78
	18	Cyprus	41,89
	19	Hungary	43,44
	20	Poland	45,81
	21	Lithuania	48,45
	22	Slovakia	50,66
	23	Italy	51,11
	24	Latvia	55,66
4	25	Croatia	67,10
	26	Greece	73,92
	27	Bulgaria	77,21
5	28	Romania	85,24



Source: author's calculations

According to the three-sigma rule, Figure 2 shows, that the first group if formed by the best sustainable developed countries in the European Union. Namely, Sweden, Denmark, Finland,

and Netherlands. The second group is made up of countries that were previously assigned to the third group with Estonia (13th place) and Malta (14th place) added to the list. Estonia improved its current position by up to 5 places. In the contrary to the previous ranking of countries, the position of Slovakia (22nd place), which belongs to the third group of countries, has improved by one spot. Croatia (25th place), Greece (26th place), and Bulgaria (27th place) form the fourth group. The worst ranked country, Romania (28th place), form a separate fifth group.

3.3. Assessment of the similarity between the countries' rankings determined by both used approaches

Using the Spearman' rank correlation coefficient, we evaluate the similarities between the rankings of countries, calculated based on weighting the indicators with the coefficients of the correlation matrix and using the partial correlation coefficients. The final ranking of countries, shown in Table 1, is calculated as simple arithmetic mean of the methods used.

Table 1. Final ranking of EU countries based on their aggregated indicators of sustainable development for year 2018

	Ranking created by correlation matrix	Ranking created by partial coefficients	Final ranking
Sweden	1	1	**1**
Denmark	2	2	**2**
Netherlands	3	3	**3**
Finland	7	4	**4**
Luxembourg	6	5	**5**
United Kingdom	5	6	**6**
Ireland	4	10	**7**
Austria	8	8	**8**
France	9	7	**9**
Germany	10	9	**10**
Belgium	11	11	**11**
Slovenia	12	12	**12**
Malta	13	14	**13**
Spain	14	16	**14**
Estonia	18	13	**15**
Czechia	**17**	**15**	**16**
Portugal	15	17	**17**
Cyprus	16	18	**18**
Hungary	**21**	**19**	**19**
Lithuania	19	21	**20**
Italy	20	23	**21**
Poland	**22**	**20**	**22**
Slovakia	**23**	**22**	**23**
Latvia	24	24	**24**
Croatia	25	25	**25**
Greece	26	26	**26**
Bulgaria	27	27	**27**
Romania	28	28	**28**

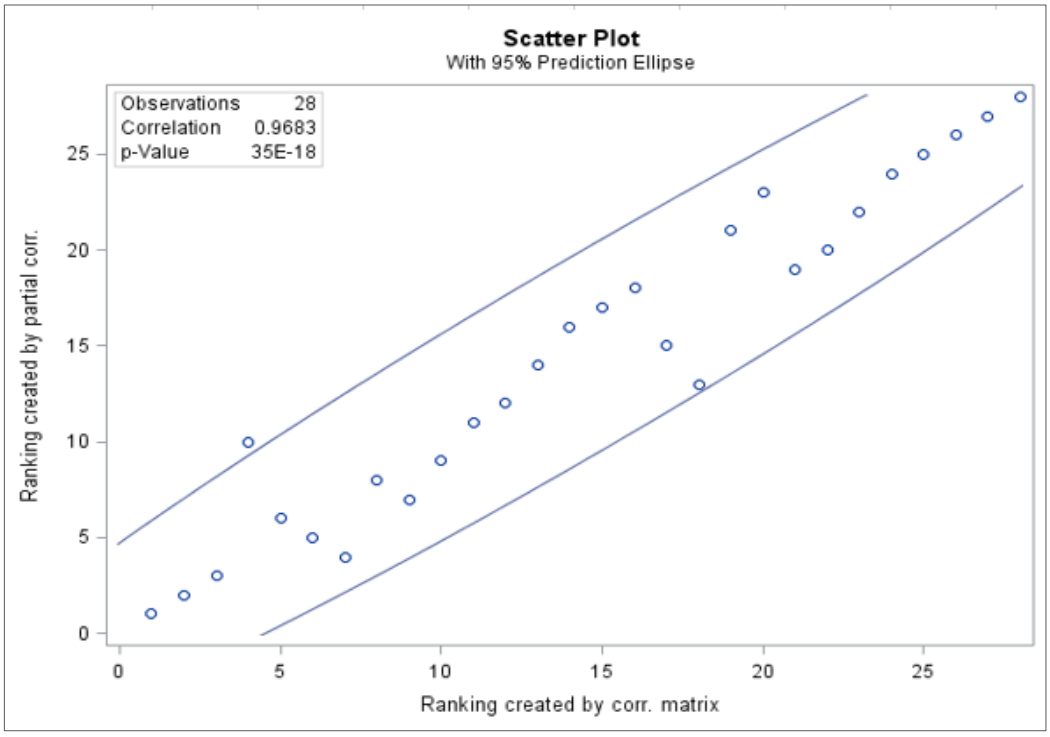
Source: author's calculations

As is shown in Table 1, Sweden is the country that performs best in terms of sustainable development. It is followed by countries such as Denmark, Netherlands, and Finland, that

are also doing well in achieving the sustainable development goals. Countries like Croatia, Greece, Bulgaria, and Romania, which are less economically developed than the rest of the EU, are ranked last. A large part of the population in these countries is at risk of poverty or social exclusion, which is connected to poor employment and incomes. The monitored countries are achieving unsatisfactory results in terms of education quality, and their economies are inefficient in terms of energy consumption. The positions of the countries calculated by both approaches corresponded in 11 cases. These countries are Sweden, Denmark, Netherlands, Austria, Belgium, Slovenia, Latvia, Croatia, Greece, Bulgaria, and Romania. The most significant difference in ranking occurred in the case of Ireland, where the aggregated sustainable development indicator calculated by weighting indicators based on the partial correlation coefficients (I-distance) fell by 6 places compared to the position determined by the correlation matrix method of weighting indicators. These discrepancies in ranking of countries between the approaches occur mainly due to the exclusion of four sustainable development indicators from the process of creating the aggregated indicator by I-distance method.

The correlations between the positions of countries determined based on aggregated indicators constructed using both approaches are verified through Spearman coefficient of correlations. The resulting Scatter plot is shown in Figure 3.

Figure 3. Scatter Plot of resulting rankings determined by both approaches



Source: author's calculations

Based on the Scatter Plot in Figure 3, we can conclude that the examined rankings of countries by both approaches have a significant linear positive correlation (p-value<0.0001) with the 95% probability. Whereby we can confirm that the methodologies for determining the rank of countries do not differ significantly. In Figure 3, we can see one outlier, Ireland, whose position differed significantly between used approaches.

4. Conclusions

The research is focused on the comparison of EU countries in terms of analysing selected sustainable development indicators for year 2018. The world's developed countries are currently trying to figure out how to achieve economic and social progress without environmental degradation. For this aim, the 2030 Agenda, which consists of 17 headline targets committed to by 2030, was adopted by UN member states. The EU member states are not on an equal level when it comes to achieving the Agenda 2030 goals. Less successful countries should concentrate their efforts on improving the areas where they are least satisfied to catch up to the most sustainable countries. We assessed the ranking of EU countries in terms of meeting the sustainable development aims, using aggregated indicators. Based on them, the countries were divided into groups according to three-sigma rule to evaluate their situation in relation to the attainment of Agenda' 2030 objectives. The aggregated indicators were calculated by two approaches. First approach used the weights of indicators, that were calculated on the base of correlation matrix. Secondly, through weighting indicators by partial correlation coefficients in each iteration step (I-distance method). EU countries can be classified into five groups based on the aggregated indicators.

The Scandinavian countries, Denmark and Sweden, have attained the best performance in the evaluated sustainable development indicators. Western countries also performed better than the EU average. However, due to high industrialisation in these countries, they achieved worse results in case of the environmental indicators such as the consumption of renewable energy sources and greenhouse gas emissions. The countries of South Europe and countries that joined European Union after 2004, were placed below EU average in terms of sustainable development targets. Slovakia is also a member of this group. When compared to the European Union average, Slovakia has the lowest rate of poverty and social exclusion. However, significant challenges remain according to indicators of lifelong learning (34.57% from EU average), official development assistance (39.39% of EU average), research and development expenditures (46,15% of EU average), GDP level (56.73% of EU average), energy efficiency (65.43% of EU average) and consumption of renewable energy sources (80% of EU average).

The Spearman's rank correlation coefficient was used to verify the consistency of countries' rankings created using aggregated indicators constructed by two methodologies. Based on the resulting p-value (0.0001), we found that the correlation between the two rankings of countries was highly significant, and so that the resulting ranks were consistent with a 95% likelihood.

The outputs of this research are influenced by the selection of indicators and by the chosen methods. The aim of the research was to select relevant indicators representing the individual objectives of sustainable development. Our results are comparable with the researches of other authors, which were mentioned in the first chapter of the paper.

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Different Aspects of Youth Unemployment in the Face of Covid 19

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Abstract

The aim of this paper is to provide a brief overview on the situation of youth unemployment in the face of Covid 19. Youth unemployment is a long-standing problem all around the world, however some countries are more affected by it than others. The study analyses the global status using available data and statistics to give a perception on the different impacts of the latest crisis that narrows the perspective to Europe. There are different aspects and country-specific contributors to the level and composition of youth employment and this study points out some of the most significant factors that are shaping the future of the European labour market. Considering the different aspects of education the paper examines the rate of early school leaving (ELET), the amount of young people who are not in education, employment or training (NEET) and how the level of education correlates to the unemployment rate. In the light of the results we can state that the recovery process in youth employment started quickly in several countries as lockdown measures were alleviated. However, available data suggest that the situation deteriorated at the end of 2020 and there are notable differences between countries in Europe in terms of the epidemic's impact on youth unemployment. Based on all these facts we can conclude that implementation of EU policy initiatives and investment could only be effective in cooperation with national actors together.

Keywords: *youth unemployment, NEET, Covid 19, ELET*

JEL Classification: *E24*

1. Introduction

The youth employment crisis has been an obstinate problem in most countries and in all regions. Global youth unemployment is on the rise and it places a heavy burden on three particular regions: Developed Economies and European Union, the Middle East, and North Africa. In these regions youth unemployment rates have been increasing since 2008. This phenomenon has a far-reaching effect on several fields of economy and the society as a whole. The job crisis of youth had existed long before the pandemic hit but with the restrictions, lockdowns and increasing insecurity young workforce has been compelled to undertake less attractive part-time jobs or unstable, sometimes underpaid positions. But many of them have been forced into temporary unemployment, and without reskilling and training opportunities they have little hope to change. COVID-19 has affected most aspects of our lives. Some impacts are positive but serious ones will complicate it even further. Evidently there are some other aspects that need to be taken into account since the health crisis affected not just youth economic and financial status but also their social and mental well-being. We can see how complex this problem might be and if no urgent action is taken, young people are likely to suffer severe and long-lasting impacts from the pandemic. Everywhere in the world one of the key factors of economic growth, stability, and the sense of security can largely depend on how much effort has been put into the youth of a nation. Younger generations are the future of humankind; their education is the key to prosperity and the future of the world lies in their hands.

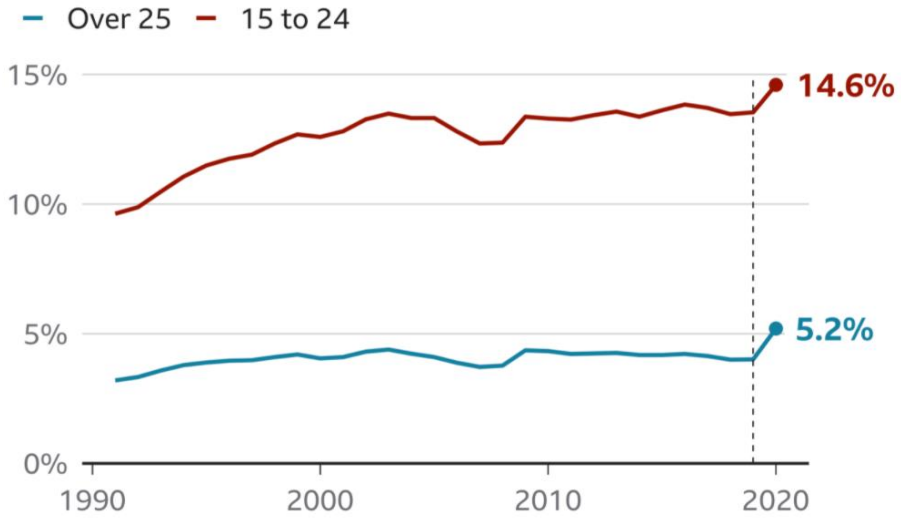
2. Literature review

However it is a relatively new field to research numerous studies have been carried out in this field. Over the last decades, youth unemployment has represented a large share in general unemployment making it one of the main problems for nations around the world. As a result, several economic and social literature aimed at clarifying the causes of this phenomenon (Claudiu M, 2018, p.50-62). However, most of the studies converge on the fundamental idea that unemployment greatly affects this category of the population due to difficult transitions from the education system to the labour market (Vuolo et al., 2012). But researchers tend to find different sources of this difficult transition. Some focus on the economic support offered to young people by their families (Kotowska, 2012) especially in Southern and Eastern Europe, others on the increasing importance they attach to extending their period of study (Kirkpatrick&Mortimer, 2011, p.112-118.). Dietrich (2012) finds several reasons for youth unemployment such as education and training systems, labour market and employment policies and the stratification and distribution of opportunities in society. Some researchers highlight the need for young people to retool their capabilities, acquire new skills and align their knowledge in order to not be outside the labour market (Chitiba, 2012, p. 23-28) In my paper I pay special attention to those focusing on the overall impacts of Covid 19 instead of examining individual countries. In a study Lyshol (2021) analyses how the length of being unemployed impacts on the possibility of finding new workplaces, The results show that young people have more difficulties with returning to the labour market after a prolonged period of inactivity than experienced workers. An evaluation from Scandurra et al. (2021) examines the territorial distribution of young people's opportunities in the EU focusing on the correlation between available resources (skills, technology etc.) and regional differences. Butkus et al. (2020) studied the connection between the effect of economic growth and unemployment enhancing the sensitivity of the unemployment rate to age, gender, and education level.

2.1. Global youth unemployment in the face of Covid 19

Youth unemployment is not a new concern for the world's societies, but one of the most alarming issues related to the labour force. After World War I alongside with the foundation of many organizations to serve international peace, justice, and long awaited stability the International Labour Organization (ILO) was established in 1919. The aim of the newly founded body was to bring governments, employers and workers together to ensure the fair regulation of labour supply, the prevention of unemployment and protection of workers, children, young persons and women as well as the promotion of decent work [[4]]. The latest ILO global estimates confirm that young workers were particularly hard hit by the crisis in 2020 across all regions and country income groups. The global employment loss between 2019 and 2020 is estimated at 8.7 % for young people, compared with 3.7 % for adults according to ILO Report 2021 [[4]]. Currently youth unemployment stands at 14,6% between the ages of 15-24 (**Figure 1**). But what is youth unemployment? As it is defined by Eurostat (The statistical office of the European Union) youth unemployment rate is the number of people aged 15 to 24 unemployed as a percentage of the labour force of the same age. Therefore, the youth unemployment rate should not be interpreted as the share of jobless people in the overall youth population.

Figure 1. Global Unemployment rate

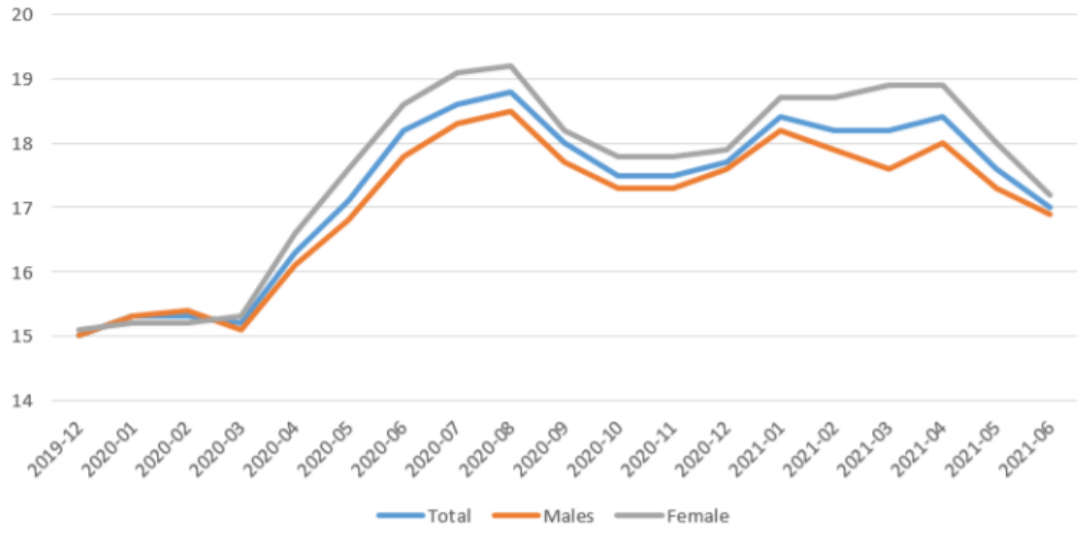


Source: ILO 2020

2.2. Different impacts of Covid 19

Before we can start analysing the impacts of the crisis it is essential to see all those effects that it has caused. That is for sure that we are well aware of the economic crisis and experience the financial and economic hardships it has triggered but less is known about the emotional and social effects. As a result of a prolonged epidemiological defence and economic crisis, a so-called "lockdown generation," or "quarantine generation," who experienced similar difficulties during a period of epidemic restrictions that has brought several fundamental changes to their daily lives. But why is youth employment an urgent problem? It is easy to see that youth unemployment can have serious social repercussions because unemployed youth tend to feel left out, leading to social exclusion, anxiety and a lack of hope for the future. Given that almost 90% of all young people live in low-income nations, not feeling that a better life is possible can result in millions of young people struggling in poverty and frustration – bringing fragile nations down with them [[7]]. Looking at areas like Africa where there are nearly 200 million people between the ages of 15 and 24 (a number that's expected to double by 2045), it's easy to see that skyrocketing youth unemployment rates will have a serious impact if not addressed. Pointing to fears of "a lost generation" who face permanent exclusion from labour markets, **figure 2** shows the sudden rise in unemployment rates in the second quarter of 2020 and that despite a slow declining trend, pre-pandemic levels have not yet been reached.

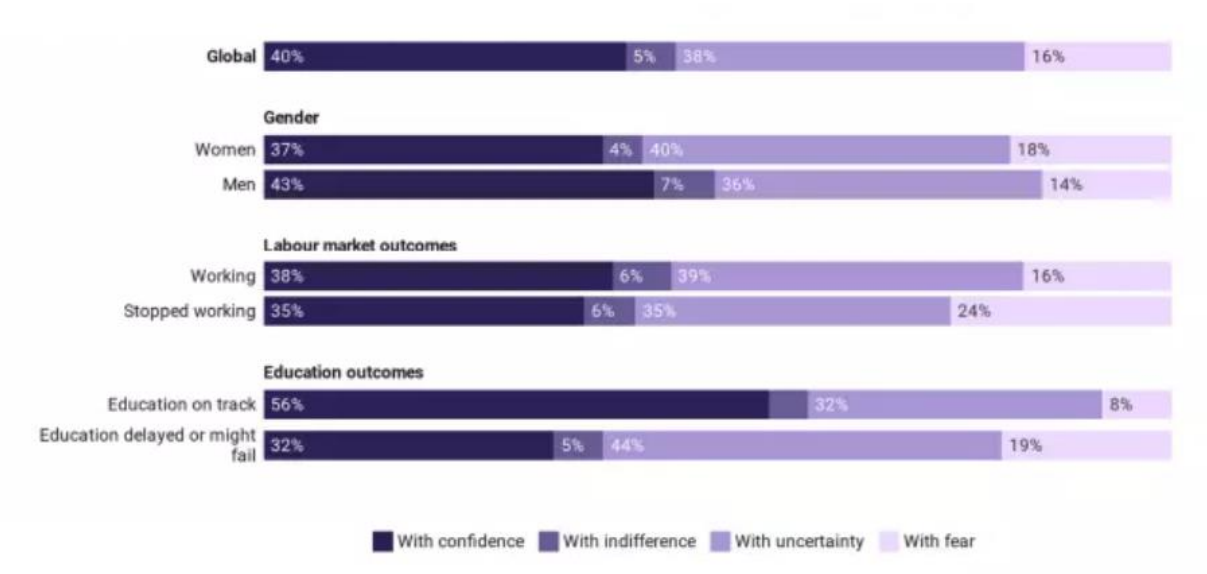
Figure 2. Youth unemployment (aged 15-24) during the pandemic



Source: Eurostat

The ILO chief cautioned that as the world recovers from the pandemic, "a lot of young people are going to be left behind. The pandemic's impact on young people has been "systematic, deep and disproportionate" [[9]] according to new research by the International Labour Organization, with young women, younger adults and youth in lower-income countries worst affected. But despite suffering disruption and lost opportunities, there is optimism for the years ahead. The next graph shows how young people see their future perspectives by taking different divisions into account. The Global Survey on Youth & COVID-19 interviewed 12,000 respondents from 112 countries, aged between 18 and 29. Conducted during April and May 2020, the findings represent a snapshot of youth opinion regarding what to expect post-Covid. The survey measures up the global average, the differences between men and women as well as between those who are still in education or have already started working (**Figure 3**)

Figure 3. Young people's (aged 18–29) perceptions of future career prospects



Source: ILO

When analysing the global average we can conclude that despite the considerable percentage (40%) of those optimistic, fear and uncertainty all together represent the feeling of more than the half of being surveyed. The rates are similar when examining the genders separately but it is obvious from findings that women are less confident about the future. Those who are still in employment 55 % are uncertain or even fearful when seeing into the future. The situation is the best for those still in education where 56% reported to be optimistic and only 8% expressed definite fear from the pandemic's impact on their career. Indifference does not represent a significant percentage of respondents; it is around 5% in each category but still indicates that 5 people out of 100 do not sense the effect of Covid 19 on their working life. In the next section I intend to showcase the methodology used to present statistics, data, and results.

2.3. Methodology

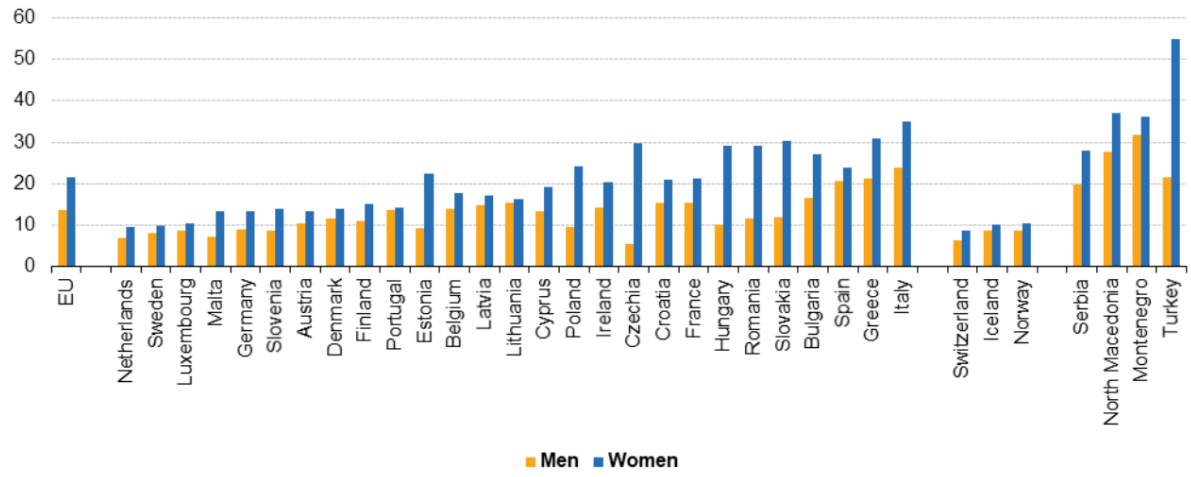
To implement this study data were taken from Eurostat statistical database and reports from ILO' database. There are various aspects and uniqe, country-specific contributors to the level and composition of youth employment but in my study I would like to point out some of the most significant factors influencing the development and current status of this field. As Butkus (2020) highlighted in his study, the unemployment rate varies significantly when it is studied from different perspectives, so based on his findings in the next section I focus on the connection between youth unemployment, gender, and education level.

3. Results

3.1. Differences between men and women

According to the latest ILO Monitor report, young women have been most affected by a rapid increase in unemployment since February. Covid 19 was hitting them "harder and faster than any other group", Mr. Ryder said, noting that they were over-represented in the informal and care economies, both of which had been deeply impacted since lockdown measures took effect. ILO figures (based on a sample of 58 countries) show that employment fell by 11.2% for young men and 13.9% for young women in the second quarter of 2020. The effects on young men and young women in middle-income economies were around double, the ILO says [[10]].

Figure 4. Young people (aged 20-34) NEET, by sex, 2020



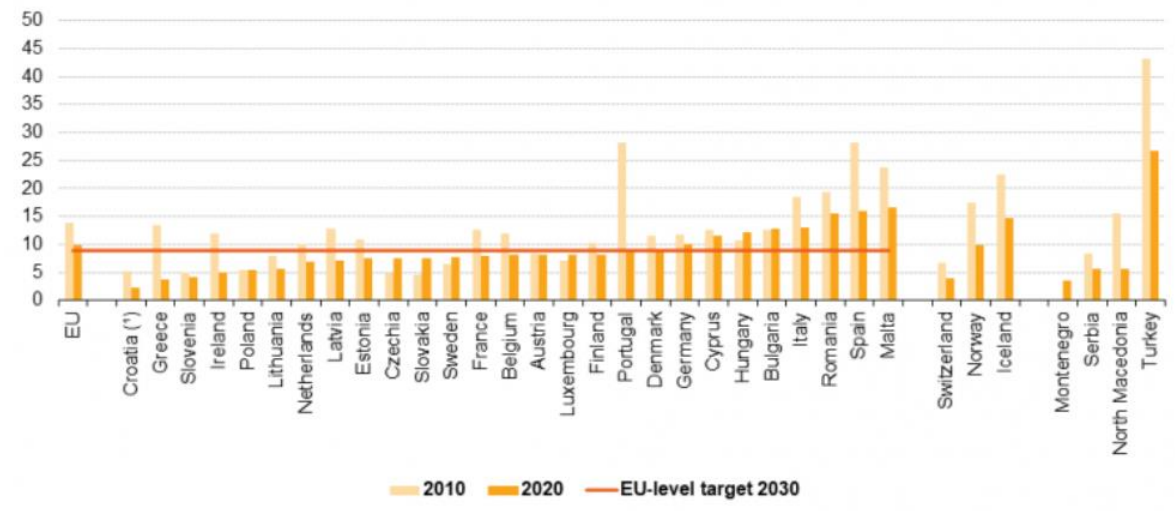
Source: Eurostat, 2020

At EU level we can see differences between countries regarding inequalities by gender but on EU average young women are more affected by unemployment illustrates the gender distribution of young people aged 20-34 who are not in education, employment, or training (**Figure 4**). Statistics show that the highest inequality can be found in Turkey but other countries such as the Czech Republic, Hungary, Romania, Slovakia experience significant disparities between men and women. In comparison the lowest inequality rates are in Sweden, Luxembourg, Iceland and Norway. The highest unemployment rates –above 30% - concerning the young women are experienced in Greece, Italy, and the Balkan states (except Serbia)

3.2. Education

Young people still in education have been challenged by a sudden transition to the education system which have been little or never tried. There are many reasons why some young people give up education and training prematurely: personal or family problems, learning difficulties, or a fragile socio-economic situation. According to Eurostat, the early leaving from education and training (ELET) rate has steadily decreased from 17.0% in 2002, to 13.4% in 2011 and to 10.6% in 2018. Although there has been a significant improvement overall, progress has stagnated since 2016 with significant differences across countries, regions, genders and for specific population groups, such as people of migrant background. The graph below (Figure 5) shows that in 2020, an average of 9.9 % of young people (aged 18-24) in the EU were early leavers from education compared to 2010 when the EU average was higher (13%). It means that the EU's goal set for reducing the ELET rate and keeping it below 10% was reached in 2020, aiming for a new target for 2030 which would be below 9%. We can see that in some countries, despite the development in this field, the ELET rate is considerably higher than the EU average such as in Romania, Spain, Malta, Iceland, and Turkey.

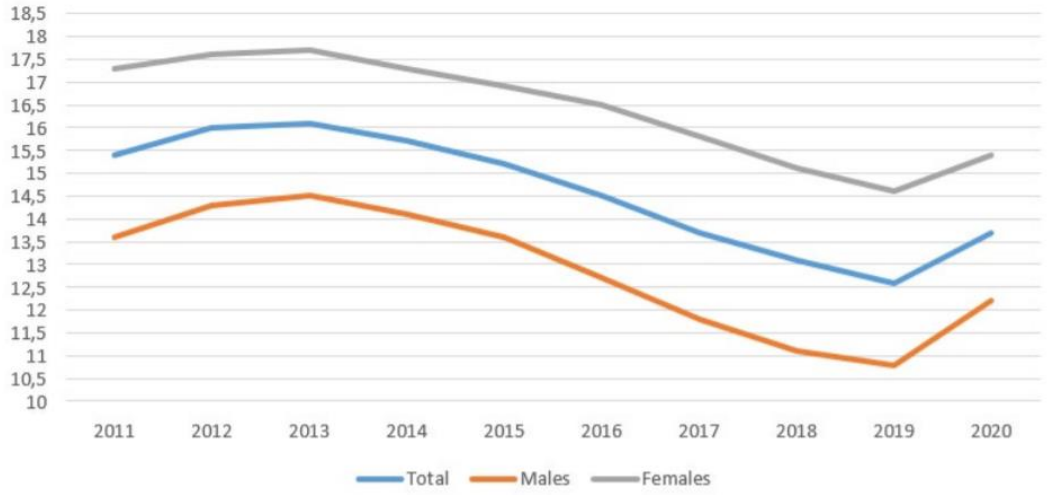
Figure 5. Early leavers from education (aged 18-24), %



Source: Eurostat

In contrast the lowest rates can be found in Switzerland, Montenegro, Croatia, and Greece. As we could see from experience that the early school leaver's rate (ELET) plays a significant role as predictor of the possibility for young people being not in education, employment or training (NEET) later.

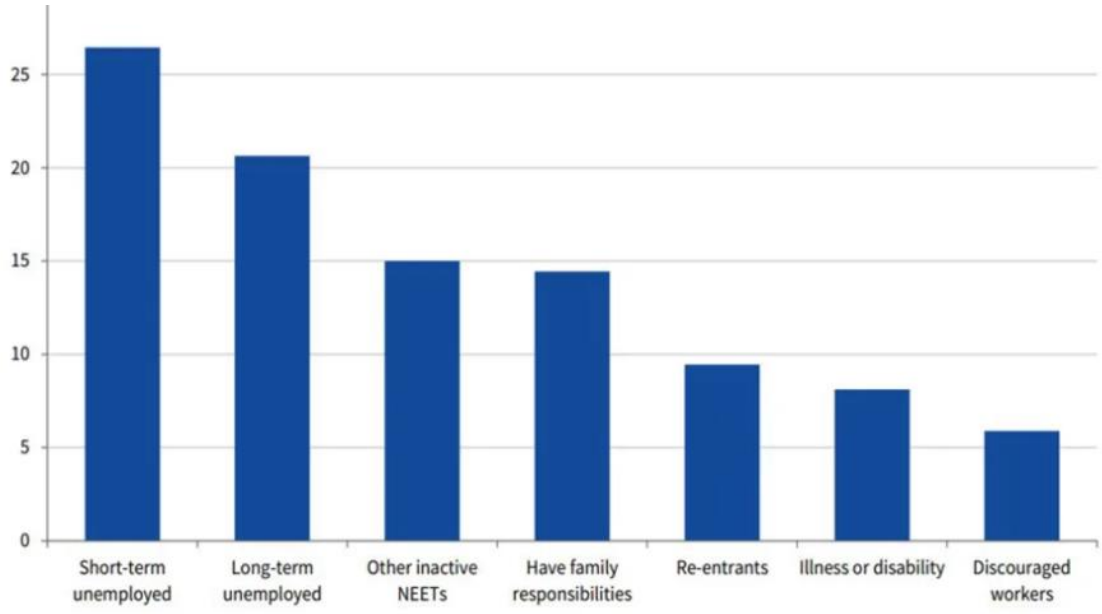
Figure 6. NEET rates by year (population aged 15-24) %



Source: Eurostat

As we can see from graph (**Figure 6**) as the pandemic hit, the overall NEET rate has increased, opposing the trend of the past decade. The lowest NEET rate was experienced in 2019 and with the crisis it started to rise and reached 13.7% as the average NEET by the end of 2020. This means that nearly 725.000 more young people (aged 15-29) in the EU were not in employment, education or training in 2020 (Konle-Seidl, 2021). It is also visible in **figure 7** that there are wide variations among Member States in the size of the NEET population and their composition. A survey conducted by Eurofound (European Foundation for the Improvement of Living and Working Conditions) in 2018 the largest category of NEETs aged 15–24 in 2015 were the short-term unemployed (comprising 26.5% of the NEET population), followed by the long-term unemployed (20.6%), those who were NEET due to family responsibilities (14.4%), re-entrants (9.4%) and those unavailable due illness or disability (8%). Around 6% of NEETs were discouraged workers, while the remaining 15% were 'other inactive NEETs' [[3]]

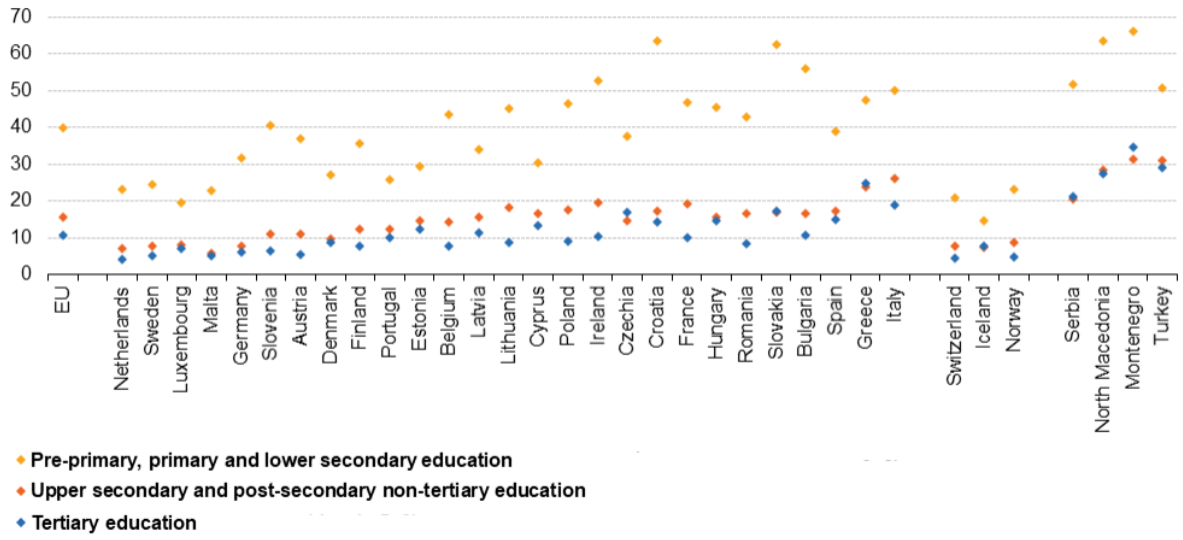
Figure 7. Composition of NEET's in Europe



Source: Eurofound, 2018

We can identify country-specific factors that include socio-economic background but also it differs by gender and the level of education as well. **Figure 8** shows that NEET rates increased across all educational levels during 2020 when taking a closer look at primary, secondary and tertiary level of completed education. The analysis also confirms that those with lower levels of education face the greatest probability of belonging to the NEET group, however Mediterranean countries experience a larger proportion of well-educated NEETs, such as Cyprus and Greece. Considering the NEET rate after primary and lower secondary education the highest percentages can be found in Montenegro and North Macedonia as well as in Croatia and Slovakia.

Figure 8. Young people (aged 20-34) NEET, by educational attainment level, 2020, %



Source: Eurostat

Another factor to take into consideration is the massive gap between what the labour market needs and what the educational system provides. Across Europe, the state provides different ways in the educational process. In some countries, such as the Netherlands and Germany, the private companies take a more significant role in the educational process, resulting in a better correlating system between the acquired skills and the labour market. But where educational systems are rather theoretical and less attentive to the demand coming from the labour market that causes difficulties for young people when finishing school. The so-called skill mismatches are the direct result of inadequate financing of the education system through government policies (Claudiu M, 2018, p. 97-112). European continental countries, such as Germany, Austria, Denmark, the Netherlands or France, offer both general education and vocational training during the schooling period so that the young graduates will be ready to enter the labour market after they have finished their education. Anglo-Saxon countries UK and Ireland - have a high-quality education system and a relatively low youth unemployment rate. Employment agencies are usually private and income support is available, but people need to prove that they are in a search for a job. The group of Mediterranean countries includes Portugal, Spain, Greece, Italy is the „worst performer". These countries have inflexible educational systems and underdeveloped labour market infrastructure. The youth unemployment rate is very high. The newer member states of the European Union, like Poland, Slovakia, Hungary, Estonia, the Czech Republic are characterised by relatively high youth unemployment rates, an increased labour market policies expenditure but increasingly flexible labour markets (Claudiu M, 2018, p. 97-112).

4. Conclusion

Looking at trends in the course of 2020 we can experience a certain extent of recovery in some countries, however it is neither a stable upward trend nor a predictable prospective for the future. Continued monitoring of the situation of young people is critical, particularly in terms of whether they are benefiting from the recovery. A key issue is the desired shift from inactivity, which requires specific focus in monitoring and policy responses to ensure that young people, especially the most vulnerable, do not become further discouraged and distanced from the labour market. As available data show, in order to reach the desired target in 2030 the EU must align policy measures with member states' governments as rates and underlying causes vary from country to country. We can see that in some countries despite the development in this field, the ELET rate is considerably higher than the EU average such as in Romania, Spain, Malta, Iceland, and Turkey. It is also important to decrease the gender employment gap which will be paramount to progress on gender equality and achieve the employment target for the entire working age population including those under 25. In countries like Hungary, Romania, Slovakia or Greece NEET rate is especially high in the case of young women compared to men. The construction of the education system also influences the status of youth unemployment showing that demand from the labour market and provided education must align. Coordinated measures can target the rate of young people neither in employment, nor in education or training by improving their employment prospects.

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The Attitude of the Successor to the Generational Exchange in Family Businesses in Slovakia

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Abstract

Family businesses in the world are among the most widespread and oldest forms of business. In Slovakia, family businesses do not have a long history, as their establishment was possible only after 1989. One of the key points of family business is the succession process. In research from around the world, we learn that only 1/3 of family businesses survive this process. In most Slovak family businesses, this process is taking place or will take place in the near future. The aim of the paper was to evaluate the attitude of potential successors in family businesses in Slovakia. Research data were collected by semi-structured interviews and subsequently evaluated by the Text Mining method. We found that the successors focused on education, practical experience, they feel that they have enough time left for the generational transfer and the act of generational exchange itself.

Keywords: *Family business, SME, succession, successor.*

JEL Classification: *M12, M51, M53.*

1. Introduction

In general, a family business can be defined as a business in which the family has a majority stake in the ownership or control of the business and at the same time at least two family members are directly involved (Shi, 2014). The difference between family and non-family businesses is that families are expected to retain the involvement of family members in business in future generations, creating a certain family heritage (Anderson et al., 2003; Chrisman & Patel, 2012; Liu et al., 2017; García-Sánchez et al., 2018; Anyakoha, 2019). In family businesses, there are more emotional attachments to the family than financial benefits (Chua et al., 2015; Gómez-Mejía et al., 2007; Molly et al., 2019). One of the specifics of family companies is especially flexibility in decision-making, preference of family members in managerial positions regardless of meeting the required criteria (Alwis, 2016). It is difficult to distinguish and separate relationships professionally and emotionally. The result of this conflict is the need for the entrepreneur to address the issue of priorities between business and personal life. According to Zygmunt (2018) however, every family has a natural tendency to survive, especially if it is existentially dependent on the results of business activities. The exchange of information is the key to the success of any business, not just the family business, because we live in an information age (Švec et al., 2018; Kljucnikov et al., 2019). This exchange of information between family members is sincere and direct and, moreover, without any speculation. Another important advantage of a family business is, according to Rahman et al. (2017) cost optimization.

In Slovakia, small and medium-sized family businesses make up more than half of all businesses (Kvašňák & Makarovičová, 2019). Given that family businesses belong to the category of small and medium-sized enterprises, their advantages therefore also lie in the advantages which are characteristic of small and medium-sized enterprises. Among the most

important are: a simple management structure, the possibility of increasing employment, innovation (Nagy et al., 2018), the ability to create self-employment, better knowledge of customer needs and the ability to solve specific problems, but especially the use of regional work, regional resources that contribute to reducing regional disparities (Mészáros & Divékyová, 2019).

Research has revealed that up to 86% of family businesses do not address the issue of succession. This is the most critical period of a family business (Zajkowski & Domańska, 2019), where the turning point also occurs (Mura & Kajzar, 2019). The founders usually try to delay this moment as much as possible in order to have the company under control. The inability to leave the business and leave it to a successor is an insurmountable problem for them. According to psychologists, there is a particularly internally suppressed fear of fear. International statistics show that only one third of family businesses can handle a generational exchange, with only a fraction of them remaining in the family for more than 50 years (Rogalska, 2018).

Family business and the associated overlap between family and working life can result in uncontrollable problems. These occur mainly where there is no sincerity and mutual trust between family members (Dudic et al., 2018; Bure & Tengeh, 2019). Literature highlights that family leadership is a central. dimension for interpreting the behaviour of family firms and performance (Miller et al., 2013; Binacci et al., 2016; Catuogno et al., 2018; Ahrens et al., 2019). When there are family members in the management of a family business, the management is more motivated and they run the business more efficiently (Miller & Le Breton-Miller, 2006). In particular, it should be noted that the work of a director who is a member of the family generally has a longer time horizon than the work of the general director of a non-family business (Le Breton-Miller et al., 2004). This means that these directors tend to make managerial decisions that will increase the company's competitiveness, leading to higher returns (Donaldson & Davis 1991). The transfer of tacid knowledge is more efficient in a family business, thanks to the strong relationship between the predecessor and the successor. This transfer is not limited to work knowledge and experience, but also extends to the social aspects and family life of individuals. This knowledge is often part of collaborative relationships within an organization (Nelson & Winter, 1982). These employment relationships are extended to family and are transferred to the family business (Chen et al., 2014). In addition, family members are usually involved in entrepreneurship from an early age in order to gain practical experience (Dyer, 1986). Early involvement in business activities that increase the succession of business-related skills and competencies is valuable (Cabrera-Suárez et al., 2001) and leads to the smooth succession of the next generation (Bracci & Vagnoni, 2011). Managers from different generations have different interests and different views on management, leadership styles and company goals (Okorafo 1999), as well as the development phase of the company (Gersick et al., 1997; Miller et al., 2007; Muñoz-Bullón et al., 2018). The literature suggests that knowledge transfer is more efficient in family businesses than in non-family businesses (Cabrera-Suárez et al., 2001).

A key question in family businesses is whether to entrust the management of the business to a family member or a non-family employee (Sciascia et al., 2013). Family businesses seek to hold power over business in family's hands (Jiang et al., 2018) however, the CEO's behaviour affects the business as a whole (Hambrick & Mason, 1984).

Family CEOs have more knowledge of the business, its culture and greater trust among stakeholders than non-family members (Donnelley, 1964). Family CEOs do not feel competition in other employees because they still have a place, which negatively affects their efforts to maximize financial results (Campbell & Marino, 1994) and this may also be reflected in the weak impact on the performance of the family business (Jiang et al., 2018). Worse results of a family CEO compared to non-family can also arise due to tensions arising from the overlap

of family goals with business (Lansberg, 1983). This unfavourable performance may require the separation of ownership from the management of the family business (Burkart et al., 2003).

However, according to Cai et al. (2012), businesses with family CEOs perform better than non-family CEOs, higher levels of liquidity and greater risk aversion (Naldi et al., 2007), however, property growth is lower than non-family CEOs (Sánchez Pulido et al., 2019). Family CEO has a more positive impact on internationalization than non-family CEOs (Lin & Wang, 2019).

However, if the family business does not have qualified and skilled family members for the needs of the business, it should focus on employing people outside the family (Chrisman et al., 2014). Employment of non-family university-educated employees affects the success of family companies (Arijs et al., 2018). Family businesses require a high level of managerial skills, which affects the performance of the business, which is why Lin & Hu (2007) recommend entrusting the management of the family business to an external CEO outside the family. For Non-family CEOs, the profitability of the business will come first, unlike family CEOs who give more weight to socio-emotional wealth than profitability (Gallizo et al., 2017). However, non-family CEOs are subject to the control by which owners control its management (Burkart et al., 1997). One of the factors why family businesses employ non-family CEOs is also the expectation of poor business performance, thereby protecting their own reputations (Jiang et al., 2018), because only a positive position in the company is the key to the profitability of (Buzzell et al., 1975). Non-family CEOs also have higher overall indebtedness, which means they are more willing to take on debts than family CEOs (Sánchez Pulido et al., 2019).

Our research is exceptional in that we deal with the views and attitudes of successors to generational exchange in family businesses in Slovakia. There is a lot of research in the world in the field of succession and family businesses, primarily focused on the owners or founders of family businesses. Our results are also specific in that we are dealing with succession in a country that ranks among the post-communist (Bakiewicz 2020; Rumanko et al., 2021).

2. Data and Methods

The aim of the paper was to evaluate the attitude of potential successors in family businesses in Slovakia. In the research, we used a qualitative method of data collection (De Massis & Kotlar 2014; Pöschl & Freiling 2020; Rumanko et al., 2021). As a method of data collection, we used a semi-structured interview (Liu 2018; Xian et al., 2021; Rumanko et al., 2021), where we focused on the attitude of potential successors to the process of generational exchange in family businesses in Slovakia. In the research, we focused on potential successors - the direct descendants of the owner of the family business. Data collection took place from March to September 2020. It was attended by 21 potential successors.

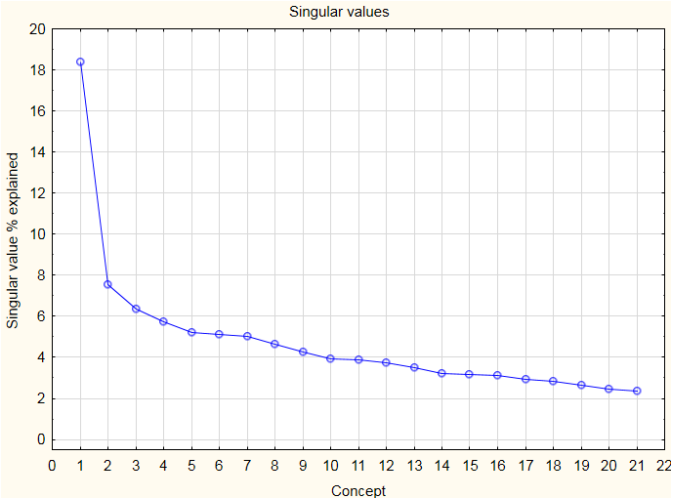
The survey involved 52.38% men and 47.62% women. Potential successors achieved the highest percentage of education at secondary school with a high school education with a school leaving exam of 61.9% and at university with 38.10%. If we look at our sample in terms of the size of the family business, micro enterprises accounted for 57.14%, small enterprises 28.57%, medium-sized enterprises 9.52% and large enterprises only 4.76%. When the company was active on the market, companies over the age of 21 were the most represented (28.57%). Enterprises from 16 to 20 years accounted for 19.05%, as well as enterprises from 11 to 15 years were represented on the market. Enterprises from 6 to 10 years accounted for 23.81% and the smallest group were the youngest enterprises under 5 years - 9.52%.

The answers of the respondents were recorded in written form in the form of un-structured text and subsequently written in MS Excel according to the requirements of the Text Mining method. Text Mining is a cluster analysis method that works with un-structured text (SAS 2009). We used PCA (Principal Component Analysis), which we used to perform and interpret

the outputs of the meaning extraction method. The aim of the meaning extraction method was to create a simple and interpretable number of topics from textual data using content words. The aim of the meaning extraction method was to create a simple and interpretable number of topics from textual data using content words. The extraction process removed functional words (prepositions, confusion, etc.) and low-rate words to preserve content (Markowitz 2021). In our case, the analytical. unit is the succession process in family businesses. We excluded from the basic set texts that contained a low number of words (below 5) so that texts with low word frequencies did not positively distort the results (Markowitz 2021). We used a list of frequencies, but as Grice (1975) states, "people often speak phrases and do not need to repeat them", so instead of using Term freqency - raw count, we focused on the inverse frequency of the document, called TF-IDF (Toosi et al., 2021), which determined the weight of the importance of words for each subtopic separately (Seo et al., 2020). Subsequently, we took the first 5 words with the greatest importance of the importance of each subtopic.

In the next step, we worked with all sub-topics as one unit and performed Concept extraction. From all 21 possible concepts that the software found for us (Figure 1), we chose 2 with the highest informative value and the most represented topics and marked them as Concept 1 and Concept 2. We used soft clustering. This model is used to group words into topics (Miner et al., 2012). The aim of the extraction method was to extract the simplest number of themes that are meaningful and interpretable, while capturing as many broad themes as possible (Markowitz 2021). We then used this grouping of topics to represent the document in a spatial environment using a scatter plot (Miner et al., 2012). In the scatter plot, we put the value of the words of concept 1 to concept 2 in the ratio (Figure 1). Based on the proximity of words, we have grouped the words into groups (topics). We focused mainly on expressions that are as far away from the axis as possible. We performed the selected methods in the Statistica program.

Figure 1. Concepts

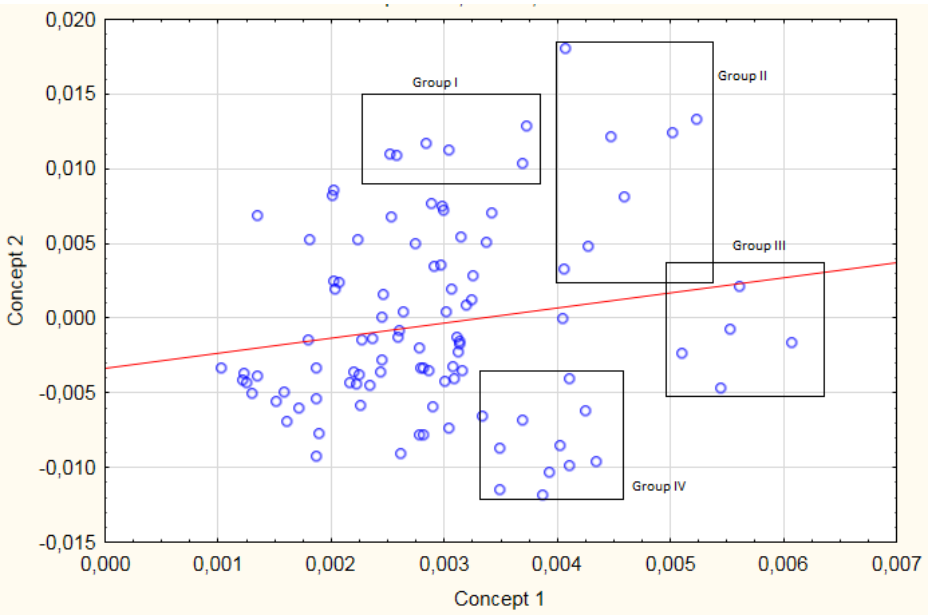


Source: Own Calculation

3. Results and Discussion

Figure 2 shows a scatter plot created from the concepts with the highest informative value. Based on the Groups, we can see the topics addressed by the successors in their answers regarding the process of generational exchange in their family business. We focused on Groups, which are outside the largest grouping of words, as they show deviations from general expressions.

Figure 2. Scatterplot of concepts



Source: Own Calculation

The Group I (experience, production, case, long-term, start) focused on experience in a family business. From the interviews, we revealed that the successors are trying to engage in activities in the family business. I understand that they must gain the necessary experience before the generational transfer itself. They considered gaining experience as a starting point in the process of succession on their part. They realize that it is not possible to just come and take on the role of running a business. They consider systematic long-term preparation to be important, during which they will be thoroughly acquainted with the functioning of the given company.

The Group II (practice, learn, father, process, manager) focuses on practice in a family business, similar to group I. However, with a greater focus on learning from the father, the owner of the family business. The owner is the person who begins the succession process and is responsible for its implementation. Successors should have experience with the family business before the generational exchange. It is necessary to know the company's management and individual business processes before the generational transfer. According to the successors, it is the transfer of experience and knowledge from the "father" that is important. The current generation of successors is largely led to the family business since childhood, so they are regularly involved in the company's activities. We have found that it is the successors who have a greater initiative to get involved in the company's activities. The most interesting results have been brought by agricultural enterprises, in which successors have been preparing for their role since childhood. However, not because someone forces them, but they want to learn as much as possible, because they enjoy working in a family business.

The Group III (business, take, future, time) focuses on the time left until the takeover. The successors said that there is still plenty of time until the generation transfer. This opinion causes in Slovakia that the succession is left to a freer course. They do not realize that this process can come much earlier and they leave their business unprepared. The cause may be a deteriorating health of the owner or sudden death.

The Group IV (exchange, generation, successor, family, plan) focuses on the process of generational exchange itself. The successor is important to the successor himself. Our respondents were successors - direct descendants of the current owner, so family businesses plan to be held only in the hands of the family. An important factor is also the drawing up of the successor plan itself, which the successors follow throughout the process.

From the above results, we see that the successors focus on education, practical experience that they can take over from the current management of the company, but feel that they have enough time left for the generational transfer and the act of generational exchange itself.

In Table 1, we see the 5 terms with the highest importance for successors.

Table 1. Weight of criteria

Expression	Importance
business	24.80
future	23.43
company	23.40
plan	20.31
take over	18.72

Source: Own CalculationThe successors placed the greatest emphasis on the term "business". A family business is important to them and they want it to operate in the market for as long as possible. The term "company" also testifies to this. They realize that although they work in a family business, it is still a business whose main function is to make a profit. The successors were aware of their position in the process of generational exchange and approached it responsibly, but they were still convinced that this event was still a distant future and had plenty of time to prepare. This fact was also confirmed to us by Group III. Our results also correspond to the statements of the SBA (2018), which revealed that succession in family businesses is only beginning to be addressed by the imminent retirement of the owner. Also, one of the most important terms for them was "plan". The succession plan has a key role to play. From Bąkiewicz's (2020) research we learn that in post-communist countries, succession planning is neglected, which may lead to the demise of the family business in the future. Family business owners consider succession to be a natural and automatic process. Also, the main reasons why they do not have a succession plan is the fact that their family business is only a micro enterprise, or. small business. However, although they do not have a succession plan, the successors are still dedicated to their personal development in the field of business and always try to be at the hands of the owner of the family business. In the latest knowledge of management, we know that training is an essential part of the profession. Unprepared managers without a managerial education are a frequent cause of failure and subsequent demise of the company. The successors also emphasized the takeover of the family business. Although they only attached importance to this moment in the future, they are already focusing on taking over. We have revealed that the successors of family businesses are taking the initiative in family business education. Our results also correspond to the statement of Lušňáková et al. (2019).

4. Conclusion

Family businesses in Slovakia right now, or in the near future, will face a intergenerational transfer. It is very important that all stakeholders are prepared for this process well in advance. Business owners have been managing this process since launch. The readiness of successors and their attitude is crucial in generational exchange. We know from research that only 1/3 of family businesses survive this process, so the process of generational exchange is considered to be the most risky in terms of business survival.

Based on the research, we have revealed that the successors of family businesses focus on education, practical experience, they feel that they have enough time left for the generational transfer and the act of generational exchange itself. Based on the results, we suggest that successors do not focus on this process as something that still has time, but pay sufficient attention to it. Managers should start with a succession plan from the moment they look for a

successor. The generational transfer does not have to take place only with the owner's retirement, but may occur unexpectedly due to the circumstances concerning the owner (sudden death, incapacity for work, etc.). This awareness of owners and successors should be discussed not only in academia but also in the general public. The best preparation for succession is the real presence of the successor to the current manager's "father". The best form of gaining experience is if the successor actually experiences different situations in the company and sees how his superior reacts to them. Based on this, he gets to know the functioning of the company.

Our research is unique because we focused on the qualitative side of research in the process of succession in a post-communist country. The results of the research will serve as a basis for quantitative research, where we will focus on individual topics from the perspective of the owner and successor. We consider it crucial to find that the initiative to learn and be a ready successor comes directly from the successors.

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Research on the Current Situation and Countermeasures of China's Population Aging Problem

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Abstract

Since the reform and opening up in 1978, China's economic development has advanced rapidly, with remarkable results: China's GDP grew from $0.06 trillion (world number 9) in 1978 to $6.45 trillion in 2010, And it became the world's second-largest economy. By 2020, China's GDP was US $15.92 trillion. With the decrease in the number of working-age people, the aging of the population has intensified, the elderly dependency rate gradually increased, and the growth rate of China's GDP has also been slowing down year by year. How to deal with the impact of population aging is a hot topic currently studied in the field of economics in China. Based on the data released by the National Bureau of Statistics of China, this article analyzes the current situation of China's population aging through reviewing and combing domestic and foreign literature, and concludes that the characteristics of China's population aging, as to put forward countermeasures and suggestions.

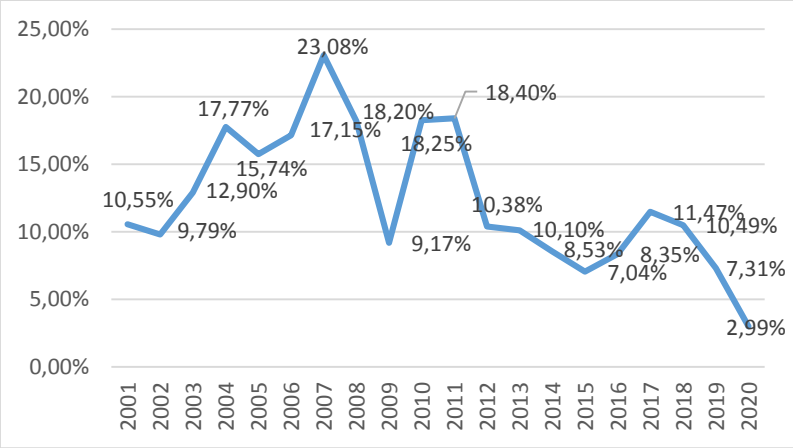
Key words: *China's GDP growth rate, Demographic Window, Population Aging, Social Human Capital*

JEL Classification: *J1, J11, J14, J18*

1. Introduction

China's GDP in 2000 was 1.003 trillion yuan, and 2020 was 101.6 trillion yuan, an increase of 91.57 trillion yuan, an increase of 913.15%, and the average growth rate of GDP was 12.38%. From Figure 1, the growth rate of GDP peaked at 23.08% in 2007, and has shown a downward trend, reaching its lowest point in 2020, with a growth rate of 2.99%.

Figure 1. China GDP growth rate from 2001-2020



Source: China National Bureau of Statistics, https://data.stats.gov.cn/easyquery.htm?cn=C01&zb=A0201&sj=2020

People are the main body of economic activities, and labor is the most important economic factor. The growth of China's economy is a quantitative growth, and the main support behind it is the continuous marginal reward brought by the excess labor supply. In 1978, China's population was 963 million, which expanded to 1.411 billion in 2020; the number of working-age population (15-64 is generally considered to be the working-age population in the world, and China stipulates that the working-age population is 16-60 for males and 16-50 for females).

After increasing from 559 million in 1978 to 1.006 billion (peak) in 2013, it continued to decrease. By 2020, the working-age population will be 889 million.

2. Literature review of Population Aging

Foreign scholars began to pay attention to the impact of population aging on economic growth earlier than Chinese scholars, and as China entered the ranks of population aging, Chinese scholars also began to study the new situation of population and economic development, the problem of Chinese population aging and the possible social and economic impact. After a large number of domestic and foreign scholars' research work, the following three conclusions have been obtained:

The first conclusion is that the aging population has a positive impact on economic growth. The second conclusion is that the aging of the population has a negative impact on the economy. Lindh & Malmberg (1999) and Lindh & Malmberg (2007) believes that the population dependency ratio will have a negative impact on the economy[16]. Pecchenino & Pollard (2002), Faruqee & Muleisen (2003) found that with the increase in life expectancy and the accelerated development of aging, the elderly will reserve part of their savings and use them for retirement, thereby reducing the corresponding education investment in the generation of children. This will be detrimental to economic development[7]. Tabata (2005) uses an OLG model that includes endogenous growth to explore the impact of population aging on long-term economic growth. The results show that: aging has a negative impact on economic growth, but population aging may alleviate the intergenerational conflict between current and future family. Liu (2008) uses statistical data and econometric models to analyze the impact of population dependency ratio on economic growth, and the conclusion shows that the two are in an inverse relationship. Hu et al. (2012) added the population aging variable to the Solow model to study the impact of aging and demographic structure changes on economic growth, theoretically deducing that aging and economic growth have an inverse relationship and verifying it by using econometric methods. Liu & He (2012) studied the impact of population aging on economic growth by constructing a OLG model, and the results showed that the impact of population aging on economic growth gradually changed from positive to negative. Wang (2014) explored the impact of population aging on economic growth using a dynamic OLG model. The results show that in the short term, aging provides more investment opportunities in human capital, resulting in a reduction in labor supply, which could hinders economic growth; In the long run, the human capital investment opportunities provided by aging have enhanced the quality of the labor force and played a positive role in economic growth.

Sun & Liu (2014) added the demographic change factors to the Solow Growth Model and studied the impact of demographic structure on economic growth by using statistical data from 1990 to 2010. The results show that the decline in the dependency ratio from 1990 to 2010 only contributed 15% to the economy, and the aging of the population will have a huge adverse effect on the economy.

The third conclusion is that the impact of aging on economic growth is uncertain and volatile. Cheng (2003) used a CGE model to evaluate the impact of China's population change on economic development. The results show that low fertility will reduce the savings rate, but there is no relationship between demographic changes and per capita income growth. Azomahou & Mishra (2006) studied the relationship between the growth rate of per capita income and the age structure of the population under non-parametric conditions. The results show that there is a nonlinear relationship between the growth rate of per capita income and the age structure of the population, and aging does not necessarily to hinder the economic growth. Jeon (2006) used data from OECD countries from 1960 to 2000 to estimate, and the results showed that population changes and economic growth are in an "inverted U-shaped" relationship. As the

aging of the population intensifies, the growth rate of per capita income first increases and then decreases.

Researchers in China mainly study how the aging of the population will affect economic growth

The first thought is that aging will affect the economic growth by influence the labor supply:

Wang et al. (2004) showed that China's demographic dividend since the 1960s will disappear around 2015, and the adverse impact of population aging on economic growth will be prominent. He put forward policy recommendations on how to alleviate the impact of population aging. Peng (2006) uses the Computable General Equilibrium (CGE) model to study the impact of population aging on the economy. The research shows that aging causes the negative growth of labor, and the slow growth of material capital hinders economic growth. He believes that the increase in labor productivity and technological progress will contribute to the sustained growth of China's economy. Wang (2007) believes that under the background of low birthrate, the aging of the population has deepened, and China's labor supply has seen low growth, leading to rising labor costs and increasing pension burdens, and adversely affecting economic growth. Effective measures should be formulated to promote the increase of human capital and production labor rate. Qi (2010) uses the population forecast data released by the United Nations in 2008 to explore the impact of aging on economic growth. The results show that aging affects economic growth through labor supply, total factor productivity, and capital formation. The conclusion that economic growth has a negative impact on economic growth. Wang & Yang (2010) studied the impact of demographic structure on economic growth and found that in the past 30 years, changes in China's demographic structure have brought a lower labor burden ratio and brought 27.23% economic growth. However, with the deepening of aging, this will restrict economic growth. Therefore, a sound education system should be improved, human capital investment should be promoted, and the social security system should be improved to provide institutional guarantees for economic growth. Zhang & Wang (2010) discussed the impact of population aging on economic growth. They believe that in the early stage of aging, the advantages of labor resources should be seized to promote economic development. Tong (2014) combined relevant data to analyze the impact of population aging on labor supply, and believes that aging will cause a limited reduction in the size of the labor force before 2030, but it will cause a rapid decline in the young labor force. They also believe that the problem of aging in rural areas and the aging of the labor force itself should be taken seriously. On the basis of previous studies, some scholars began to pay attention to the economic effects of other aspects of labor. Zhu & Wei (2017) used the Computable General Equilibrium (CGE) model to incorporate the labor efficiency of different age groups into the labor supply factors, and studied the impact of population size and age structure, labor participation rate and total labor force, and total effective labor force between labor factor prices, economic output, and industrial structure. Studies have shown that only considering the impact of labor population changes on labor supply will underestimate future economic growth.

The second thought is that aging will affect the economic growth by influence the human capital:

The view of some scholars is to support the conclusion that the aging of the population will benefit the accumulation of human capital. Hu (2002) believes that China's human capital has been significantly improved from 1980 to 2000, and the next 20 years will be a period of rapid development of China's education. It is necessary to seize the opportunity to establish a learning society and create an international competitive advantage. Qu (2013) studied the impact of population aging on economic growth from the perspective of the substitution of population quality and quantity. Studies have found that aging contributes to the accumulation of human capital, and the current population policy contributes to China's economic growth. Zhang & Zhao (2018) used the OLG model to explore the impact of the population age structure on the

accumulation of human capital, as well as the relationship between human capital and economic growth. The study found that aging, declining birthrate and education human capital have a positive relationship, and aging has a positive relationship with human capital, but the increase in human capital is not conducive to economic growth. He proposed that human capital accumulation should be increased to cope with the rapidly developing aging population. Another part of the view supports the conclusion that population aging will hinder the accumulation of human capital. Zhao & Han (2015) used dynamic panel regression models to explore the impact of population aging on capital, human capital, technological progress, and economic development. The research results show that aging is conducive to the formation of capital, but it has an adverse effect on human capital, technological progress and economic development.

The third thought is that aging will affect the economic growth by influence the savings rate path:

Different views also arise on exploring the impact of the aging population on savings rates.

Some views believe that aging will increase the savings rate. Hu & Xu (2014) explored the impact of population aging on household savings rate and found that aging will not reduce the savings rate. The relationship between aging and rural savings rate is "inverted U", but the relationship between aging and urban savings rate is positive. Wang & Ai (2015) used the Over Lapping Generational (OLG) model to study the impact of aging on the savings rate and forecast China's regional savings rate from 2015 to 2050. The research results show that with the accelerated development of aging, it will promote the rise of the savings rate, but the negative effects of future aging will exceed the positive effects of the rise of the savings rate. Li & Luo (2018) analyzed the relationship between the age structure and the savings rate based on the data of Chinese households from 2010 to 2014 and showed that the positive effect of aging on the Chinese household savings rate is greater than the negative effect of consumption patterns on the household savings rate, especially for families with lower incomes. Another part of the view is that aging will hinder the increase in the savings rate. Wang (2016) explored how population aging affects economic growth by constructing a generational overlap model. The study found that aging has a negative impact on savings, human capital and economic growth. At the same time, the adjustment of the fertility policy cannot fundamentally change the adverse effects of aging on economic growth. It should improve the accumulation of social human capital and increase the efficiency of human capital utilization. Zhao (2017) studied the impact of aging and pension insurance on household savings rate under the OLG model that includes pay-as-you-go and personal account models, combined with statistical data from 2001 to 2014. The results show that the aging of the population will lead to a decline in the savings rate. It is proposed that the pension insurance system should be improved, and a flexible retirement system should be implemented.

The fourth thought is that aging will affect the economic growth by influence the other sector:

Fan & Mu (2018) use the system GMM to study whether the increase in population aging will cause a country to fall into a "middle income trap" and hinder economic growth. The research results show that aging has a negative impact on economic growth. The increase in aging will reduce the probability of a country crossing the “middle-income trap”. It is believed that human capital and total factor productivity should be increased to delay the long-term impact of aging on economic growth. Lu & Wang (2019) used China's provincial data from 1997 to 2016 to study the impact of population aging on economic vitality and its mechanism. Research results show that aging slows down economic vitality by affecting employment levels and hindering technological innovation.

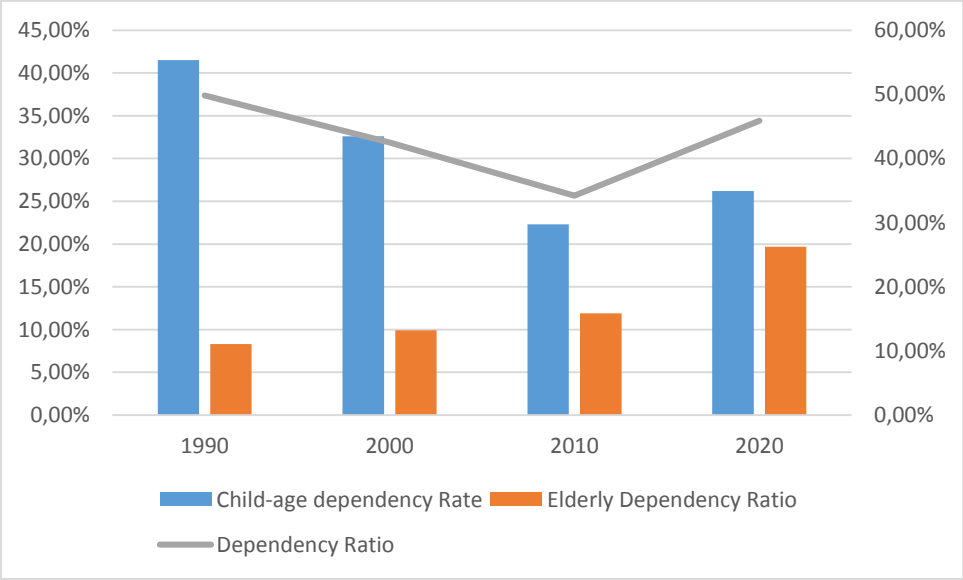
3. Current status and characteristics of China's Population Aging

3.1. Current status of China's Population Aging

The demographic factor is an important factor in the economic growth of a country or region, and changes in the demographic structure profoundly affect social and economic development. China has entered a society with an aging population since the beginning of this century. With the gradual aging of the population structure, the aging rate of the population has gradually increased. Therefore, it is very important to analyze the current situation and characteristics of China's population aging through demographic data.

According to the census data of the National Bureau of Statistics of China, the population age structure and dependency ratio statistics have been available since 1990. The total population in 1990 was 1.143 billion, of which the population aged 15-64 was 763 million, and the Dependency Ratio was 49.8%, the Child-age Dependency Ratio was 41.5%, and the Elderly Dependency Ratio was 8.3%; the total population in 2000 was 1.267 billion, of which 888 million people aged 15-64, the Dependency Ratio was 42.6%, the Child-age Dependency Ratio was 32.6%, and the Elderly Dependency Ratio The ratio was 9.9%; the total population in 2010 was 1.341 billion, among which the population aged 15-64 was 990 million, the Dependency Ratio was 34.2%, the Child-age Dependency Ratio was 22.3%, and the Elderly Dependency Ratio was 11.9%; the total population in 2020 was 14.11, the population aged 15-64 is 968 million, the Dependency Ratio is 45.9%, the Child-age Dependency Ratio is 26.2%, and the Elderly Dependency Ratio is 19.7%.

Figure 2. China Dependency Ratio from 1990-2020



Data Source: China National Bureau of Statistics, https://data.stats.gov.cn/easyquery.htm?cn=C01&zb=A0301&sj=2020

Analyze from the total population of China and the population of each age group. At present, China's population growth rate has maintained a steady growth, and the total population has continued to rise. By the end of 2020, the total population has risen to 1.411 billion. Among them, the number of minors (the number of people aged 0-14) has shown a downward trend year by year. In recent years, under the influence of the country's "two-child policy", the number of minors has increased. However, due to the gradual formation of the new concept of parenting and the increasing cost of raising children, the increase in the number of minors is not obvious. Since 2000, the number of labor force aged 15-64 has gradually increased. In 2013, the number of labor force in China reached 1.006 billion. Since then, the number of China's

labor force has been declining year by year. By 2020, the number of working-age people has fallen to 889 million. The total population of this part of China who is mainly engaged in labor has begun to show negative growth. In 2020, the number of senior citizens (the number of people aged 65 and over) will reach 191 million and will continue to increase year by year. According to calculations from the National Bureau of Statistics, from 1991 to 2000, the growth rate of the population aged 65 and over was 3.34%; from 2001 to 2010, the growth rate of the population aged 65 and over was 2.68%; from 2011 to 2020, 65 The growth rate of the population aged and over was 4.28%. The growth rate of the elderly population has accelerated, and the accelerated development of aging has become irreversible in the short term.

Analyzed from the measurement indicators of population aging, the aging rate of China's population in 2001 was 7.10%. In 2020, the population aging rate will reach 13.50%, and the growth rate of the population aged 65 and over in China will be as high as 6.40%. This shows that China's population aging is developing rapidly.

Analyze from the demographic indicators, mainly from the three levels of the Dependency Ratio, the Child-age Dependency Ratio, and the Elderly Dependency Ratio. The size of the Dependency Ratio depends on the relative changes in the Child-age and Elderly Dependency Ratio. Due to the long-term influence of the national population policy, China's Child-age Dependency Ratio has generally shown a downward trend. At the same time, with the rapid development of medical services, the life expectancy of the Chinese population continues to increase, the population structure is gradually aging, and China's Elderly Dependency Ratio is rising year by year. In 2000, the Dependency Ratio of the Chinese population was 42.50%, the Child-age Dependency Ratio was 32.60%, and the elderly dependency ratio was 9.90%. China's Child-age Dependency Ratio has shown a downward trend year by year, the Elderly Dependency Ratio has shown an upward trend year by year, and The Dependency Ratio has shown a trend of first decline and then rise. Before 2010, The Dependency Ratio of the population showed a downward trend because the decline in the Child-age Dependency Ratio exceeded the increase in the Elderly Dependency Ratio; however, after 2010, the Child-age Dependency Ratio showed an upward trend, and the Elderly Dependency Ratio accelerated, resulting in The Dependency Ratio and increase year by year. Therefore, in 2010, the total dependency ratio of China's population reached the lowest value in recent years, which means that China's demographic dividend period is about to pass, and the population burden will become heavier in the future.

3.2. Characteristics of Population Aging

Affected by population policies and traditional concepts, the characteristics of China's population aging process are: population aging is developing rapidly and on a large scale; population aging is developing unevenly; "the population grows old before it gets rich."

3.2.1. The population aging develops rapidly and large scale

At present, China's total population accounts for about 20% of the global population. The huge population determines that the scale of China's population aging is huge. In 2001, when China began to enter a society with an aging population, the number of people aged 65 and over had reached 97 million. In 2020, the number of people aged 65 and over has risen to 191 million. According to the United Nations' World Population Prospects, China's population of 65 years and over will rise to 371 million in 2050, and the population aging rate will rise to 26.35%.

In 1970, China's total population accounted for 22.14% of the world's total population, and the population of 65 years and over accounted for 15.22% of the world's total population of 65

years and over. In 2010, China's population of 65 years and over accounted for 20.90% of the world's total population of 65 years and over, and the total population accounted for 19.39% of the world's population. This shows that the rate of population aging in China is faster than the world average. In 2020, China's population of 65 and over will account for about 50% of the population of 65 and over in developing countries. As the mortality rate decreases, China's elderly population will gradually increase, which will have profound influence in the global population structure.

According to the report of the American Institute on Aging and the Census Bureau, the number of years 65 and older in developed countries accounted for the proportion of the total population increased from 7% to 14% of the total number of years required: France 115 years, Sweden 85 years, the United States 75 years, Australia 70 years, 45 years in the UK, 38 years in Germany, 30 years in India, 24 years in Japan, and 16 years in Singapore. According to estimates by Wu et al.(2004), it will take about 28 years for China to increase the aging rate from 7% to 14%; Yuan (2017) estimates that it will take about 25 years for China to increase the aging rate from 7% increase to 14%. The estimation results show that China's population aging is developing rapidly, and it only takes half the time of developed regions to cross this stage.

3.2.2. Unbalanced development of Population Aging

The unbalanced development of population aging is mainly manifested as: unbalanced regional development, urban-rural inversion, and gender differences.

3.2.2.1. The aging population presents uneven regional development

In 2001, China had entered the ranks of an aging society. Twelve of the 31 provinces and municipalities across the country have entered an aging society (the aging ratio is greater than 7%). In 2020, 30 of China's 31 regions except Tibet have entered an aging society. Among them, the population of a total of 4 regions is within the range of population aging rate greater than 7% and less than 10%, and population aging rate of 26 regions exceeds 10%, which means that China is already in a severely aging society. It can be seen from Table 1 that the degree of aging in China varies greatly among regions. The aging development of provinces in the eastern region precedes and is faster than the provinces in the central and western regions. With the accelerated development of aging, this will have a far-reaching socio-economic impact on the eastern region.

Table 1. Degree and ranking of aging in various regions in China

Area	Aging Level in 2000	Rank	Aging Level in 2010	Rank	Aging Level in 2020	Rank
Beijing	8.39%	4	8.71%	12	13.30%	16
Tianjin	8.29%	5	8.52%	15	14.75%	11
Hebei	6.87%	14	8.24%	19	13.92%	13
Shanxi	6.19%	18	7.58%	25	12.90%	19
Neimenggu	5.35%	26	7.56%	26	13.05%	18
Liaoning	7.83%	8	10.31%	4	17.42%	1
Jilin	5.87%	23	8.38%	16	15.61%	7
Heilongjiang	5.42%	25	8.32%	18	15.61%	6

Shanghai	11.53%	1	10.12%	6	16.28%	4
Jiangsu	8.75%	3	10.89%	3	16.20%	5
Zhejiang	8.85%	2	9.34%	9	13.27%	17
Anhui	7.45%	9	10.18%	5	15.01%	9
Fujian	6.54%	16	7.89%	21	11.10%	24
Jiangxi	6.11%	19	7.60%	24	11.89%	22
Shandong	8.03%	6	9.84%	7	15.13%	8
Henan	6.96%	13	8.36%	17	13.49%	14
Hubei	6.30%	17	9.09%	11	14.59%	12
Hunan	7.28%	11	9.78%	8	14.81%	10
Guangdong	6.05%	20	6.75%	27	8.58%	29
Guangxi	7.13%	12	9.24%	10	12.20%	21
Hainan	6.61%	15	7.80%	22	10.43%	26
Chongqing	7.90%	7	11.56%	1	17.08%	2
Sichuan	7.44%	10	10.95%	2	16.93%	3
Guizhou	5.79%	24	8.57%	13	11.56%	23
Yunnan	5.99%	21	7.63%	23	10.75%	25
Tibet	4.58%	28	5.09%	31	5.67%	31
Shanxi	5.94%	22	8.53%	14	13.32%	15
Gansu	5.00%	27	8.23%	20	12.58%	20
Qinghai	4.25%	31	6.30%	29	8.68%	28
Ningxia	4.45%	30	6.41%	28	9.62%	27
Xinjiang	4.52%	29	6.19%	30	7.76%	30

Data Source: China Statistical Yearbook, http://www.stats.gov.cn/tjsj/ndsj/2021/indexch.htm

Part of the reason for the uneven development of China's aging population can be attributed to the average life expectancy of the population and population migration. With the development of the economy and the improvement of medical and health conditions, the life expectancy of the Chinese population reached 76.34 years in 2015. Among them, the average life expectancy of the population in the eastern region is 77.28 years, the average life expectancy of the population in the central region is 75.02 years, and the average life expectancy of the population in the western region is 72.18 years. Due to the improvement of medical standards in the eastern region and the improvement of the social security system, the average life expectancy of the population in the eastern region exceeds that of the central and western regions, which is also an important reason for the regional differences in population aging.

In terms of population migration, the continuous reform of China's household registration system has made the policy resistance of population migration weaker. With the gradual widening of the economic and social development gap between the eastern, central and western regions, the population is mainly migrating to the eastern region. Eastern China has the highest rate of population migration, and the scale of population migration will gradually expand. The immigrant population in the eastern region mainly migrated from the central and western regions. Among them, the scale of population migration in the central region is larger than that

in the western region. The direction of population migration partly explains the imbalance in the development of China's regional population aging at this stage. With the migration of labor to the eastern region, the population aging in some eastern cities has been delayed, such as Shanghai and other places, while the migration of labor in the central and western regions has further aggravated the aging phenomenon of local populations, such as Anhui and Hubei. Although population migration cannot fundamentally explain the reasons for the formation of population aging, the direction of population migration explains to a certain extent the reasons for the intensified development of regional population aging.

3.2.2.2. The phenomenon of urban-rural inversion in the Population Aging

The aging of China's population is not only manifested in regional imbalances, but also in urban-rural imbalances. It can be seen from Table 2 that with the continuous development of society, the economic gap between China's urban and rural areas has gradually widened, and rural laborers have gradually migrated to cities. Because children and the elderly do not have labor, coupled with the high level of urban consumption, most of the children and elderly in rural families can only stay in the countryside. In addition, with the improvement of the level of rural medical care, the life expectancy of the rural population has gradually increased. Taking the above factors into account, the aging degree in China's rural areas is more serious than that in cities, and the gap between urban and rural aging is gradually widening.

Table 2. Comparison of the level of aging in urban and rural areas

Proportion of urban and rural age groups		2000's	2005's	2010 's	2015's	2020 's
Proportion of population aged 0-14 in total population (%)	City and town	18.43	19.44	16.87	17.04	18.42
	Rural area	25.49	21.94	19.16	19.18	25.52
Proportion of population aged 15-64 in total	City and town	75.27	72.43	75.15	73.6	75.16
	Rural area	67.16	68.5	70.78	68.78	66.98
Proportion of population over 65 in total population (%)	City and town	6.3	8.12	7.98	9.36	6.42
	Rural area	7.35	9.54	10.06	12.04	7.5

Data Source: China Statistical Yearbook, http://www.stats.gov.cn/tjsj/ndsj/2001c/d0406c.htm, http://www.stats.gov.cn/tjsj/ndsj/2006/indexch.htm, http://www.stats.gov.cn/tjsj/ndsj/2011/indexch.htm, http://www.stats.gov.cn/tjsj/ndsj/2016/indexch.htm, http://www.stats.gov.cn/tjsj/ndsj/2021/indexch.htm

3.2.2.3. Gender differences in aging

In terms of gender differences, the ageing of the female population in China is more serious than that of men. The aging rate of women has always been higher than that of men. The important reason for this phenomenon is that the life expectancy of women aged 65 and over is higher than that of men of the same age. In addition, similar conclusions can be drawn in the analysis of sex ratios. As the age increases, the sex ratio is declining. In 2020, the sex ratio for 65-69 years old is 101.85, while the sex ratio for 90-94 years old is 41.48, which shows that there are more women in the same age group than men.

4. Conclusions and Suggestions

4.1. Conclusion

Based on the statistical data released by the National Bureau of Statistics of China, this article explores the impact of China's population aging on economic growth, and draws the following main conclusions:

a) With the development of social civilization and the improvement of economic level, China's population aging has gradually deepened. In 2020, the population aging rate will reach 13.52% and the growth rate of the total elderly population will be 4.00%. Observing China's economic development after 2000, we can find that population aging and population growth rate have a certain negative impact on China's economic growth. The labor force, physical capital, and human capital have a positive impact on economic growth. At the same time, the degree of influence of the labor force, population aging, and human capital on China's economic growth shows regional differences. Compared with other countries in the world, China's population aging will further accelerate its development, and the social and economic contradictions caused by population aging will become more prominent. In the future, the trend of accelerated development of China's population aging will be difficult to change in a short time, and relevant preparations should be made in advance to deal with population aging.

b) Fully explore the second demographic dividend, improve the old-age security system, fully release the relative advantages of the elderly population, and extend the employment market for the elderly; moderately delay the retirement age, partially expand the supply of labor, and reduce the burden of social pensions. At the same time, we should improve the current education and training system, improve the quality of labor in rural areas, and improve social human capital. In particular, we should increase the stock of human capital in the central and western regions and provide necessary talent reserves for regional industrial transfer and upgrading. Finally, formulate corresponding population migration policies to reduce the cost of labor population mobility, delay the development of regional population aging, and promote the overall development of the regional economy.

4.2. Suggestions

Facing the current severe situation of population aging, it is necessary to find new driving forces to promote economic development, seize the opportunity of the second demographic dividend, and solve the problem of population aging in the development process.

4.2.1. Take full advantage of the demographic opportunity window

For a long time, the first demographic dividend has become an important reason for China's economic development. In the future, the second demographic dividend will become a long-term driving force for economic growth, and it will also bring new opportunities to social development. The second demographic dividend will come from the demand for old-age security and system supply, the expansion of labor participation rate and the expansion of educational resources. At the same time, the aging of the population means an increase in the life expectancy of the population, which provides an opportunity to tap the second demographic dividend.

a) Improve the old-age security system. For the elderly in China, the current stage mainly relies on the family or individual pension model. If a mixed pension security system (the "combination of social pooling and personal accounts" model implemented in China's basic pension insurance) is established, labor can be used. The pensioners' expectation will increase their savings motivation and the appreciation of the capital market to maintain a high savings rate and sufficient social capital to guide them into the field of economic growth and provide financial support. At the same time, the establishment of a comprehensive old-age security system will give full play to the advantages of the elderly population and extend the employment market for the elderly, which will benefit China's economic growth.
b) Properly postpone the retirement age. Taking into account the positive impact of the labor force on economic growth, delaying the retirement age can expand the supply of labor, which not only helps to alleviate the burden of social pensions, but also effectively leverages the human capital advantages of the elderly population and reinvests the rich labor experience and accumulation of the elderly population. In the production field, economic development can be better promoted. For China, although the total population is large, the stock of human capital is not large enough, and the situation in each region is not always the same. Taking into account the relatively low stock of human capital of the working population approaching retirement, once the retirement age is delayed, most of the elderly will fall into the predicament of poverty. Therefore, when formulating the retirement age policy, the actual situation of each region should be taken into consideration to implement the policy in different regions and stages.

4.2.2. Increase the stock of social human capital

a) Improve the current education and training system. With the deepening of China's population aging and the transformation of economic growth mode, China's advantages in the number of labor forces should gradually shift to improving the quality of labor. Increasing and improving the number and quality of labor is the guarantee for long-term economic growth. In view of the positive driving effect of human capital on economic growth, it is helpful to improve the quality of human capital in China to effectively increase the stock of social human capital and guide young people to increase investment in their own human capital. Therefore, an education and training system suitable for all ages should be established, vocational education and lifelong education should be vigorously developed, and innovative talents should be cultivated to increase the stock of human capital in society.
b) Increase the talent pool in the central and western regions. At this stage, the direction of regional industrial transformation depends on the difference in its factor endowments. Specifically, the eastern region of China will enter a stage of manufacturing upgrades and transformation to the service industry. The manufacturing industry will shift to the 6 central provinces and the west, and the western resource belt will become China's resource "base". Therefore, in the context of the accelerated development of population aging, the central and western regions should improve the quality and skills of workers in response to the new development of the manufacturing industry, and for the transfer of regional industries, and upgrade the necessary talent pool to promote the long-term stable growth of the regional economy.

c) Improve the level of education in rural areas. With the optimized development of the industrial structure, social and economic development requires more and more highly qualified labor. At this stage, the average level of education of the labor force in rural areas is relatively low and the labor skills are unskilled. Therefore, how to solve the problems related to the professional development of the labor force in rural areas and effectively improve the quality of the population will have a significant impact on the construction of a new countryside. The accelerated development of population aging has directly led to a relative reduction in the supply of labor, especially in the case of China's urban-rural dual structure, the reduction of rural labor is more prominent. Compared with urban areas, the population quality and labor skill proficiency of the labor force in rural areas are relatively low, and the education level and labor skill level of the labor population in rural areas are improved. Through the establishment of a life-long learning and training mechanism, it will be conducive to the flow of rural labor, the transformation of rural industries and the construction of new rural areas, so as to overcome the outstanding problems of rural aging in the development, and it will be conducive to the economic growth of rural areas.

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Green Infrastructure Reframing Historical Courtyards: Enhancing Urban Resilience in Budapest

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Abstract

Understanding the resilience of urban forms as a combination of physical, social, and cultural elements is essential for defining successful transformative and adaptive processes in urban fabrics. In this regard, Budapest's 9th district is an outstanding example of transforming a complex historical urban context by the implementation of different renovation strategies to improve the social character, without disrupting the urban morphology. With an analytical approach to the renovation process, this research seeks to address the transformative and adaptative process that occurred, while preserving urban heritage and providing new layers of use for the area. Furthermore, courtyards have great relevance for the definition of well-being in areas of high occupational density and for the morphological structuration of the urban fabric of Budapest over time. This article intends to identify the connections between the emergence of a healthier, greener, and consequently, more resilient urban environment in the 9th district of Budapest, in addition to the implementation of an Urban Green Network.

Keywords: *Historical courtyards, Neighbourhood, Space Syntax, Urban density, Urban connectivity*

1. Introduction

Defining the ideal density of an urban territory has been a highly-discussed subject among academics and professionals in the field of contemporary urbanism. Identifying the delicate combination of factors that underlie the balance between the urban sprawl and the amount of space necessary for human social life (Choldin, 1978), is an issue with greater relevance in a context where the ever-increasing population desires to achieve a healthier and more sustainable future, owing to the exponential intensification of the climate change process (Kamal-Chaoui and Robert, 2009).

When developing an approach on this topic, it is necessary to be aware that the urban density is unique in each location and is rather a matter of performance (Acioly and Davidson, 1996). Socio-cultural factors directly impact the composition of density and the individual experience of interacting with the environment, also towards the perspective of sustainability (Bramley and Power, 209).

Like other European cities, Budapest has its central core dense, compact, and highly integrated with the rest of the urban fabric (Benkő, 2011). However, this urban configuration becomes more heterogeneous and less dense in areas located in the "expanded city center" between the second and third transportation rings, which consecutively makes those areas more susceptible to transformation and possibly less resilient (Ribeiro and Gonçalves, 2019).

Adapting the physical and social conditions in historic urban areas can be significant steps of a strategic plan for enhancing resilience in areas susceptible to transformations and disturbances (Ribeiro and Gonçalves, 2019). Density, when seen as one of the primary structuring elements of morphology, can be manipulated in order to produce urban conjunctures

more adequate to the contemporary needs of a city, without necessarily disfiguring its spatial key definitions (Acioly and Davidson, 1996).

The global understanding of urban density must be carefully balanced with the open area system and green infrastructure, whether for public-private or semi-public use. Finding the adequate distribution of dwelling in the urban territory must be associated with quantitative issues of the urban network flow (and the capacity of the urban infrastructure a compounded system), and qualitative matters, such as distribution of functions, landscape constitution and control, and accessibility to green/leisure spaces (Richards et al., 2017).

This paper intends to interpret the rebounds of the adaptative recovery process of an urban area, through the analysis of the case-study of Middle Ferencváros, Budapest, under the scope of the inner courtyards' reconfiguration. The intervention in question aimed to produce a more integrated and healthier territory, through the use of urban green infrastructure strategies, without drastically reducing the levels of occupational density and minimizing the impact on the historical morphological arrangement of urban blocks.

1.1. Historical courtyards as a tool for physical and social transformation in Ferencváros

The middle area of the IX district of Budapest, other than presenting typical characteristics found in the mixed-use central historic regions of the city, such as the proportions and layout of urban blocks and built structures reproducing urban patterns, this area is also composed of urban voids left by former industries. This conjuncture is typical of transitional urban stretches located between the city center and the suburbs in Budapest (Benkő, 2011).

The building set comprised mostly closed urban blocks, in which the subsequent facades continually granted the impermeable aspect both physically and visually, from the pedestrian's perspective. The narrow, long-lined, and poorly lit courtyards usually had little or no permeable floor area without green elements.

The elaboration of the proposal for the renovation of the district IX started in the '80s. Still, the process only reached its maturity between the late '90s and the beginning of the 2000s, when the most significant transformations occurred (Locsmandi, 2011). The core idea emerged from the intention to accomplish a comprehensive green infrastructure network, with nodular and linear elements, that would allow a better urban connectivity, accessibility to green areas, increased biodiversity, and strengthening of the economic and social scenario in the intervention area (Heidt, 2008).

To achieve these goals, one of the main measures adopted was the restructuration of the system of private areas, starting with the integration of courtyards. Those relatively small areas, previously accessible only by individual entrances, were integrated, generating wide spaces for communal use with shared maintenance. This change enabled the creation of multiple accesses and the implementation of extensive green areas.

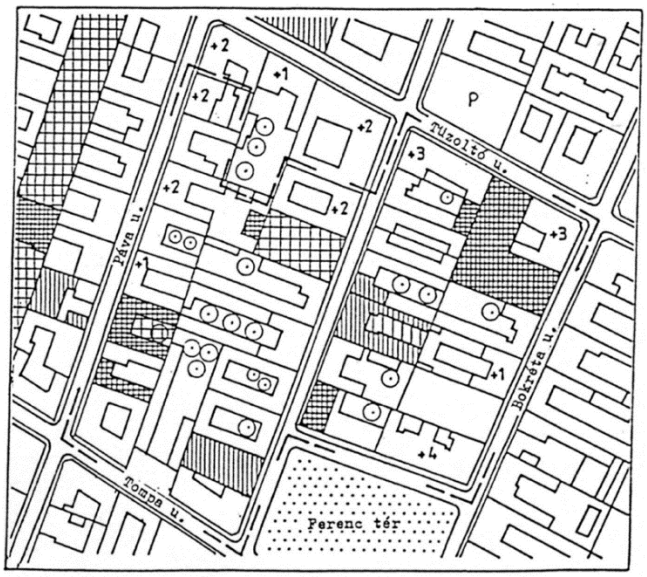
In addition to allowing recreational use, the newly designed green areas also intended to improve housing conditions for the inhabitants living in the units facing the inner courtyard. Furthermore, the intervention aimed to generate greater permeability in the urban blocks and increase the availability of commercial areas, in addition to developing better conditions of use and more visibility for activities performed at the floor level of the buildings.

1.1.1. Integrating former industrial areas into the renovated urban tissue

Before the renovation work started in the middle of Ferencváros, this region was characterized by its heterogeneous state being, at this time, considered a medium-density area occupied mainly by lower-middle-class residential buildings and small industries. Non-residential use represented about 21% of the total area (Locsmandi, 2011). The urban voids left by inactive

industries intensified the lack of territorial cohesion and problems related to the composition of the urban landscape (Monclus and Díez Medina, 2018).

Figure 1. Two older blocks of middle Ferencváros – hatched areas as small industries

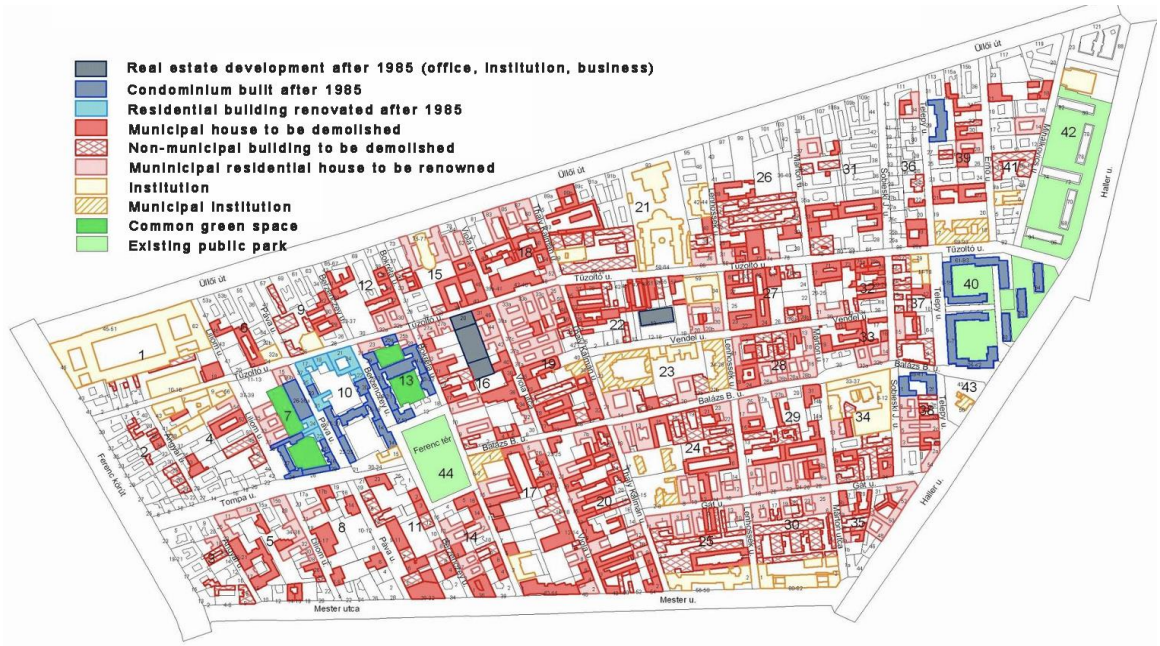


Source: (LOCSMÁNDI. 2011)

1.1.2. Filling urban voids with green infrastructure

Some buildings were selected for total or partial demolition as part of the territorial and landscape integration strategy. Most of them were in municipal ownership, which facilitated the management of the renovation action. Other municipally-owned buildings were determined for renovation. A percentage of the new areas obtained with these measurements, in articulation with the voids of the former industrial plots, was designated to establish green spaces.

Figure 2. Land use analysis of middle Ferencváros, 1990 (Municipal data)



Source: Own Calculation

2. Data and Methods

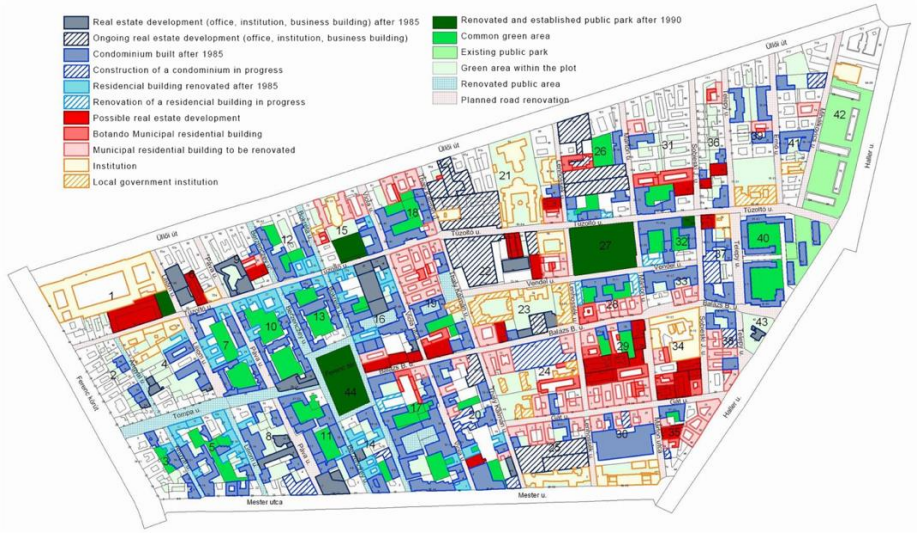
This case study-based research focuses on literature review and morphological appraisal. It is determined a thirty-year timeframe to cover the most critical changes in the analyzed urban context. Therefore, this study relies on research on evidence of a specific study area, based on data collection - satellite imagery/map analysis and data collection – and data analysis for spatial configuration evaluation, by utilizing the software DepthmapX proceeding from the Space Syntax theoretical approach.

Figure 3. Global integration analysis of Budapest's southern region network (2020) performed on DephtmapX– by author

Source: Own Calculation

With the aforementioned tools, this paper aims to examine the correlation that exists between the transformation of private courtyards into larger shared green spaces (figure 4) and the growth in territorial integration. The results of this study may lead, in the future, to a further assessment of the different green forms and their individual performance in terms of integration and connectivity in the urban territory (Batty,2004).

Figure 4. Land use analysis of middle Ferencváros, 2007– increased common green areas. (Municipal data)



Source: Own Calculation

3. Results and Discussion

For a better understanding of the results obtained from the techniques of the analysis of spatial configurations, it is essential to highlight that, in the scope of the Space Syntax spatial theory, human behavior (forecasted activity) is the great mitigator of the investigation. According to Whitehead (1961), "activity means the origination of patterns of assemblage, and mathematics is the study of pattern" (Hillier, Learman, and Stansall, 1976).

With the DepthmapX application, an analysis of the integration of the chosen network was performed. The evaluation radius setup as a calculation basis for this study was 800m, considering that this is an adequate average distance for walking on urban stretches from any point to the closest connection to the public transport network, or primary services, for example (Cirianni et al., 2018).

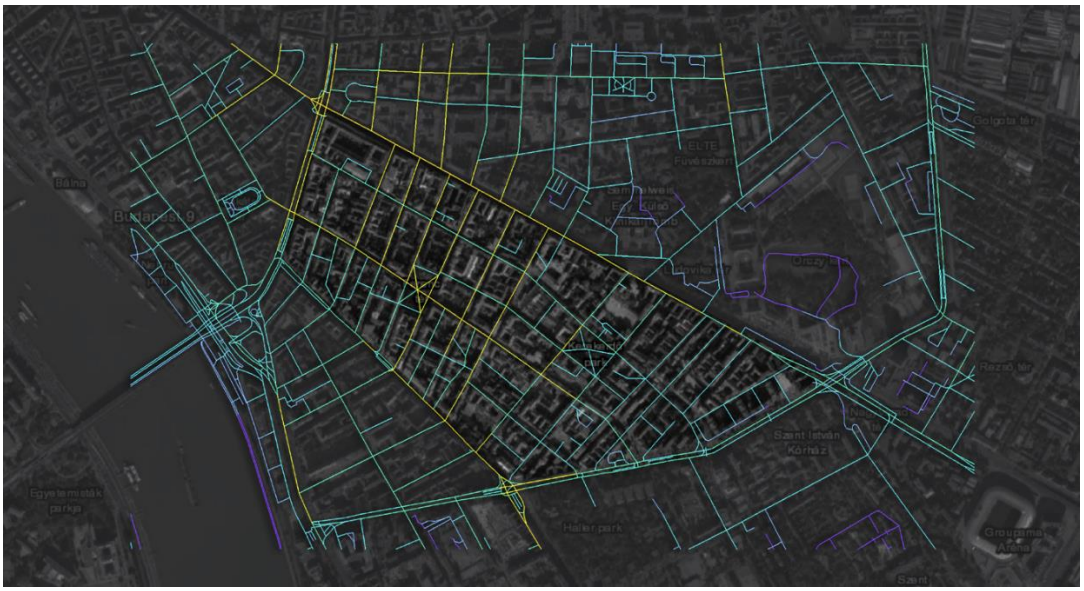
As input for the first phase of the investigation, the road network was used from the middle of Ferenceváros region dating from 1990. At that time, the road network and the pedestrian paths coincided in almost the entire territory. Thus, it is possible to notice that the axes (primary spatial components) allowed restricted territorial integration due to the morphological configuration of the area, limiting movement to the edges of urban blocks - a typical feature of historic urban settings. As an outcome, those conditions lead to a territory with lower levels of integration, symbolized on the map by the dominant presence of cold colors (figure 5).

Figure 5. Global integration analysis of middle Ferencváros (1990) performd on DephtmapX– by author

Source: Own Calculation

For the second step of the analysis, the same parameters were defined in the software work environment. However, as an input, it was used the road network established after the implementation of the urban renewal, dating from 2020. As indicated on the map (figure 6), several new pedestrian-only axes have been implemented, crossing the inner section of the urban blocks, represented by the color cyan. It represents not only a significant growth in quantitative terms of integration, but also meaning quality improvement, since all the designed new axes are part of the green infrastructure network implemented.

Figure 6. Global integration analysis of middle Ferencváros (2020) performd on DephtmapX – by author



Source: Own Calculation

4. Conclusion

Looking back into Ferencváros urban structure from the 1990's, we can observe a heavily built area with mostly residential use. The urban blocks lacked enough pedestrian connections and green spaces, which resulted in an unhealthier urban environment with decreased resilience.

When proposing such a bold intervention to an urban concentration, specially a historical one, it is of utmost importance to carefully identify all factors involved in order to propose the correct way of modifying them an achieve the prosed goal. After analysing the plan proposed and executed by the Hungarian government, it is feasible to say that the intervention was successful in reducing the levels of occupational density while minimizing the impact on the historical morphological arrangement of the urban blocks.

Furthermore, by integrating the urban voids, demolishing some housing blocks and increasing and connecting the green spaces, they successfully improved the connectivity by creating new pedestrian roads, connecting the streets with the interior part of the new open areas. Additionally, by creating new and bigger open areas where people could enjoy the benefits provided by green spaces, the urban health improved, creating a much more resilient neighborhood.

In conclusion, this study-case based research aimed to interpret the rebounds of the adaptative recovery process of an urban area, through the analysis of the case-study of Middle Ferencváros, in Budapest, under the scope of the inner courtyards' reconfiguration. These preliminary results indicate the success of such landscape architecture approach when dealing with an urban intervention of this character, opening up the discussion of the feasibility of applying such methods to future interventions. Budapest being a city with a heavy character of courtyard-based architecture, understanding and improving successful intervention methods applied in the past can only benefit the city, the citizens and the environment, creating a more resilient city one intervention at a time.

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Analysis of Consumer Behaviour on the Bee Products Market in Relation to the Health Trends

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Abstract

Nowadays, consumer behaviour is changing constantly, especially in the food sector consumer's needs and desires are influenced by various trends. Aspects such as sustainability and health trend are becoming more important. There is an increasing number of consumers who are interested in nutritious food products that can help to maintain and improve health. Likewise, the concept of sustainability has become relevant in consumers' minds. Consumption of products that are made in sustainable conditions evokes a positive feeling of having done something great for the community and consumer's health. In this paper, take a closer look at the beekeeping sector in the context of sustainability and on the bee products market. Bee products are mostly known for their positive effects not only on health but also in medicine and cosmetics. To achieve the main objective of the paper we applied a questionnaire survey to gather data. In total 332 questionnaires were collected. The current situation on the market showed that due to the trend of healthy eating the consumption of honey is rising. Actual honey production in Slovakia is approximately about 4000 tons a year. We found out that besides honey, a minority of respondents consume mead, propolis and bee pollen. The majority of respondents (68%) claimed that they do not know bee products called Apilarnil as well as Perga pollen (54%). The results showed that 71% of respondents consume bee products to support their immunity. More than half of respondents (60%) consume bee products due to their healing effects and as a prevention against diseases (58%). From the point of view of the factors influencing the purchasing decision, the results showed that the most important factor is quality and the least influencing factor was the design. Finally, 62% of participants claimed that they buy bee products directly from Slovak producers.

Keywords: *Bee products, Consumer Behaviour, Consumption, Health Trend*

JEL Classification: *M31, Q13*

1. Introduction

Consumer needs and wants concerning food are changing constantly. The food sector has been changing due to economic and technical innovations in society. In more depth, Bigliardia & Galati (2013) declared that food processing and manufacturing had a substantial effect on the complete food supply chain. Companies have been forced to pay close attention to food products that meet customer demand. According to Grunert (2017), the trends such as health, sustainability and the authenticity of food are becoming more important to consumers. Anklam (2006) claimed that during the decades, consumer perceptions of food quality has changed rapidly. In addition, perception is not included only objective attributes for instance price, taste and safety but likewise subjective ones connected to environmental, ethical and social concerns as well intrinsic food characteristics (Annunziata & Scarpato, 2014; Dowd & Burke, 2013). In more depth, purchasing process toward agricultural food is not influenced only by the main factors such as social, personal, psychological and cultural factors. Other specific factors influencing purchasing decision enter process. These factors differ from country to country. In

addition, Ribeiro, Fernandes, Cabo & Diniz (2019) defined that in decision-making process towards agro-food products is based on the appearance of the products. Thus, criteria such as size, colour and shape play a very important role in the purchasing process. Furthermore, consumers are also influenced by the marketing mix, specifically 4P. The concept of healthy food has become more important among consumers. Oravecz & Kovacs (2019) pointed out that the number of consumers who follow a healthy lifestyle has increased significantly. Similarly, Grunert (2017) declared that the increasing consumers' interest in health products is obvious, taking into consideration its positive supply trend occurs recently. Thus, Kieliszek et al. (2018); Testa, Asciuto, Schifani, Schimmenti & Migliore (2019) claimed that consumers are looking for products with the highest quality of ingredients, benefits for the health and also rich in vitamins and nutrients.

1.1. Perception of Bee Products Concerning the Health Trend

Regarding health, bee products such as honey, bee pollen, propolis, royal jelly, beeswax and bee venom have all been utilized in modern and traditional medicine in many cultures. Bee products have high nutritional value and beneficial effects that positively influence health. Moreover, they are an excellent source of bioactive ingredients including proteins, essential amino acids and monounsaturated fatty acids (Yucel, Topal & Kosoglu, 2017). Furthermore, Kafantaris, Amoutzias & Mossialos (2021) consider bee products as a superfood because of the health and nutritional benefits and for their positive therapeutic properties as well. Several studies have been made and shown that bee products have many health-supporting effects, for instance, antioxidant, cardiovascular, anti-inflammatory, anticancer, respiratory and antibacterial properties (Samarghandian, Farkhondeh & Samini 2017; Meo, Al-Asiri, Mahesar & Ansari, 2017).

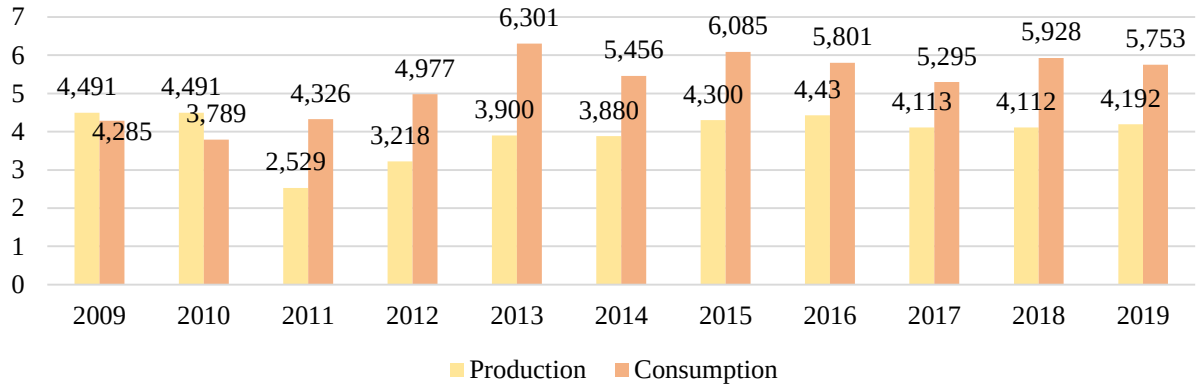
According to Testa et. al. (2019), the consumption of bee products, especially honey is rising. In addition, honey stands for the most valuable one among bee products in terms of production, consumption and revenue in the beekeeping sector. Moreover, Kafantaris, Amoutzias & Mossialos (2021) claimed that the most widespread edible bee product is honey. Research done by Niyaz & Demirbaş (2017) revealed that the most purchased bee product among the consumers in Çanakkale (Turkey) is honey. Consumption and purchasing of other bee products were evaluated as very low. Finally, Marangos & Taycu Dolu (2019) in their research found differences between the level of knowledge of consumers about bee products and the level of confidence of consumers in purchasing bee products and the differences between gender, age, and the level of education. As mentioned above, consumer behaviour of agricultural food is influenced not only by the main factors but also specific factors. The same situation occurs with bee products, especially with honey.

1.2. Honey Production and Consumption in the Slovak Republic

At the beginning of the period, in 2009, the total consumption of honey was 4,285 tonnes. In the following year, it decreased by 496 tons to the value of 3,789 tons. The increase in total consumption was obtained from 2011 to 2013. The year 2011 represented a total honey consumption of 4,326 tonnes. The total consumption of honey reached the highest values in 2013, specifically 6,301 tons. Overall, if we look at the previous year 2012, this increase represented in total consumption by almost 27%. There was a slight decrease to 5,456 tons in 2014. The following year, the total consumption increased slightly by 629 tons. In the last monitored year 2019, the total consumption reached the level of 5,753 tons. Based on the recorded data, it could be concluded that the total consumption of honey in tonnes in 2019 reached the level of 5,753 tonnes. This represents an increase of 34% in total honey consumption compared to 2009.

According to data, honey production in 2009 and 2010 reached its maximum of 4,491 tons. In 2011, there was a significant drop in honey production. A decrease of 1,962 tons to a level of 2,529 tons was recorded, which in percentage terms represents a decrease of almost 44%. The decline in production was mainly due to weather fluctuations. Production in 2012 increased slightly by 689 tons compared to 2011. The level of honey produced in 2013 and 2014 was approximately the same, about 3,900 tons. In 2015, the value of production reached the level of 4,300 tons. The last monitored period was 2019 when honey production reached the level of 4,192 tons. This represents a drop of 7% in total honey production compared to 2009. In the context mentioned above, it can be concluded that the total honey consumption exceeds the total production.

Figure 1. Comparison of a honey production and total honey consumption in Slovak republic in tons



Source: own elaboration based on NationMaster; Statistical Office of the Slovak Republic (2021)

1.3. Sustainability as a New Opportunity in Beekeeping Sector

According to Gaviglio, Bertocchi & Demartini (2017), in agriculture, sustainability can be measured by assessing principles based on pillars of society, environment and economy. Regarding, bee products contribute to sustainability. Pollination has a major impact on agricultural production in terms of quality and quantity (Vrabcová & Hájek, 2020). Moreover, Pocol, Šedík, Brumă, Amuza & Chirsanova (2021) declared that organic beekeepers in the EU have to follow specific principles associated with sustainable practices based on European laws and independent authority of apiary inspections. Sustainable beekeeping is based on improved methods. These methods closer clarify the principles in the organic beekeeping sector. They deal with natural materials, for example, bees must be kept in hives built of natural materials for instance wood or hay. Another principle is associated with organic pasture. Apiary must be situated in an area where organic nectar and pollen are abundant without any plant protection products. Moreover, the beekeeper must list the locations of hives to the certification body. There have been several studies dealing with sustainability in the beekeeping sector. For instance, Pocol et al. (2021) made a study in Romania. According to the results, the majority of participants claimed that their beekeeping practices were conventional. Almost 20% claimed that their beekeeping practices were organic. The remaining 25% of respondents declared that they were practicing a mixed type of beekeeping. In addition, when discovering awareness of principles of organic beekeeping, more than 82% declared that they were aware of the principles involved in organic beekeeping. According to the findings of Vapa-Tankosić, Ignjatijević, Kiurski, Milenković & Milojević (2020), the majority of respondents (45%) were willing to pay a premium of 20% to 30% for organic honey over honey made in conventional conditions.

Patel, Pauli, Biggs, Barbour & Boruff (2021) contributed the fact, that the beekeeping sector can contribute towards 15 of the total 17 goals of United Nations Sustainable Development Goals. In general, the most important are dealing with the problems of poverty and hunger, health maintenance and a healthy lifestyle, achievement of sustainable systems of production and consumption, innovation and building sustainable communities. Finally, Chlebo (n.d.) claimed that in Slovakia is only one beekeeper registered which keeps bees in the way of organic farming, even though hundreds of beekeepers keep the bees naturally. Although there is the potential to expand organic beekeeping. Due to difficult certification, control process as well stagnant organic honey pricing, the number of organic beekeepers is low.

To conclude, beekeeping is an activity with many benefits for the environment. Beekeeping plays an important role in food production, ensuring sufficient nutrients. It creates an indispensable part of sustainable agriculture, contributes to a healthy environment and the health of the population and also provides ecological balance and maintains biodiversity (Panta, 2020). That being said sustainable beekeeping makes new opportunities in the sector.

2. Data and Methods

To explore consumer attitudes towards the bee products primary data were collected through the online questionnaire survey. Data were collected from February to April 2021. A questionnaire survey was semi-structured and divided into three sections. The first section contains questions about bee products consumption. The following section includes questions related to purchasing habits towards the bee products. Finally, the socio, economic and demographic questions were inducted into the last section. The questionnaire survey contains closed and open questions, we used a 5-point scale to find out which factors influence the bee products purchase. Before applying the questionnaire, we performed a pilot test with five respondents to verify whether the target audience understood the issues. The final research sample contains 332 respondents. Table 1 represents the socioeconomic characteristics of the sample. It can be concluded that the men and women were represented equally. The majority of the research sample represented were employed participants between the ages of 18 to 25 who had monthly income between 801€ to 1,000 €.

Table 1. Socioeconomic characteristics of respondents

Variable	Category	Frequency	Frequency %
Gender	Female	179	54%
	Male	153	46%
Age	18 – 25	67	20%
	26 – 35	54	16%
	36 – 45	56	17%
	46 – 55	61	18%
	56 – 65	49	15%
	Over 65	45	14%
Monthly income	Up to 400 €	59	18%
	401 - 600 €	51	15%
	601 - 800 €	37	11%
	801 – 1000 €	112	34%

	1001 – 1200 €	56	17%
	More than 1200 €	17	5%
Economic activity	Student	51	15%
	Employed	199	60%
	Unemployed	6	2%
	Entrepreneur (freelancer)	22	6%
	Maternity leave	6	2%
	Pensioner	48	15%
Place of residence	Urban	175	53%
	Rural	157	47%

Source: own processing according to questionnaire survey (2021)

3. Results and Discussion

At the beginning of the questionnaire, respondents were asked to answer the filter question if they consume bee products. Almost 96% of participants declared consumption of bee products. The remaining 4% of respondents declared no consumption because of allergies and dislike of the bee products.

When identifying which bee products participants consume the most, we can conclude that the majority of answers showed only honey. The consumption of other bee products such as bee pollen, propolis and mead were evaluated as rare consumption. Moreover, the largest percentage of participants claimed that Perga pollen (54%) and Apilarnil (68%) are not known at all among them. Neto, Paiva & Santos de Novais (2020) were investigating the consumption of bee products in Lower Amazon. Based on the results, they observed that the most consumed bee product among consumers was honey. Only 12% of respondents claimed consumption of other bee products. The most common responses were royal jelly (5%) and propolis (7%). Finally, Aytop, Akbay & Meral (2019) demonstrated that besides honey, propolis, royal jelly and pollen were consumed rarely among the participants in Turkey. The purchasing trends of other bee products vary from country. In regard, Pocol & Bolboaca (2013) stated that the most purchased bee product based on the data was propolis, followed by pollen, beeswax and royal jelly.

The next research question was dealing with bee product consumption among the family members. Almost 90% of consumers have declared that bee products are consumed by the whole family. Only 6% of respondents claimed consumption among adults. The minority (4%) of participants stated that only they consume bee products. A similar analysis of the results was achieved by Guziy, Šedík & Horská (2017), who compared the consumption of honey in Russia and Slovakia. By comparing the consumption, it can be concluded that in Slovakia approximately 87% of respondents indicated the consumption of honey among the whole family. Almost 5% of the research sample declare the consumption of honey only among adults. There was an insignificant percentage of respondents (1%) who declared that in their family is honey consumed only among the children. On the other hand, in Russia, 65% of participants claimed honey consumption among the whole family but almost 19% of answers were stated for honey consumption only among the children.

In addition, 62% of respondents claimed that they purchase bee products directly from Slovak producers. Data obtained by Wu, Fooks, Messer & Delaney (2015) showed that consumers strongly agreed with the statement that honey produced locally is of better quality than honey imported from other countries. The majority of Romanians in the study by Pocol & Bolboaca

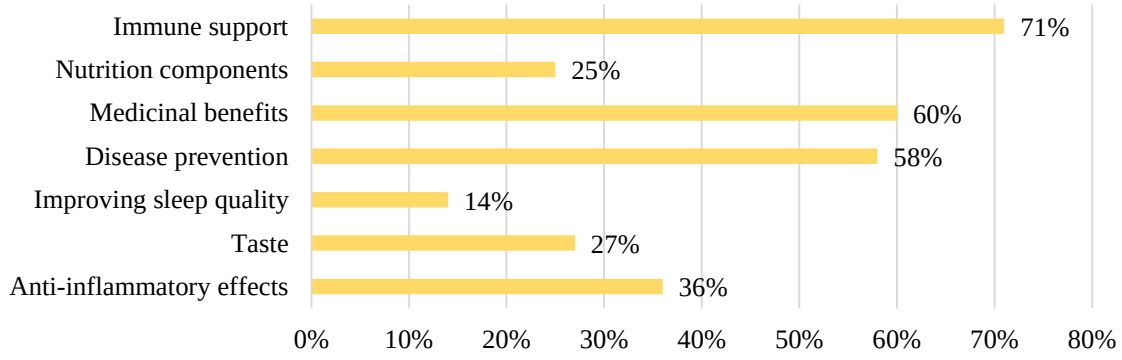
(2013) believed that the honey produced by beekeepers are of higher quality than the honey available in hypermarkets.

Table 2. Results of the questionnaire survey

Do you consume bee products?	**Yes**	**96%**
	No	4%
Consumption of other bee products (besides honey) and frequency of consumption	Mead (rare consumption)	49%
	Bee pollen (rare consumption)	14%
	Propolis (rare consumption)	30%
	Royal jelly (rare consumption)	8%
	Perga pollen (rare consumption)	7%
	Apilarnil	0%
Bee product consumption by family members	Whole family	90%
	Only me	4%
	Only adults	6%
	Only children	-
Do you purchase bee products directly from Slovak producers?	Yes	62%
	No, I do not consider the country of origin	38%

Source: own processing according to questionnaire survey (2021)

Figure 2. Reasons for bee product consumption



Source: own processing according to questionnaire survey (2021)

When it comes to reasons for bee products consumption, more than 71% of participants consumed bee products to boost their immune system (Figure 2). According to the results, the major reasons for consuming bee products were their medicinal properties. The strong motivation for consuming was also for disease prevention and the anti-inflammatory effects. Consumption only for the taste was evaluated by 27% of respondents. For comparison, Ismaiel, Kahtani, Adgaba, Al-Ghamdi & Zulail (2014) were identifying the main motivations for consuming honey in Saudi Arabia. The obtained results revealed that the major reasons for

consuming honey were mostly as a medication (71%). In addition, almost 27% of respondents consumed honey as a food. According to Šedík, Predanócyová, Horská & Kačániová (2021), the research found out that honey is mostly used as food among urban consumers in Slovakia. Strong motivation to consume honey as a medicine accounted for 44% of respondents. The cosmetics value of honey was indicated by 10% of participants. Moreover, the study made by Ignjatijević et al. (2019) was discovering the reasons for honey consumption in Italy, Serbia and Romania. The obtained results showed that the majority of respondents claimed honey consumption because of its taste. Consumption for health benefits was declared by 31% of respondents in Italy, 36% of respondents in Romania and 37% of respondents in Serbia. The minority of respondents in each country declared consumption because of sickness.

Table 3 represents the results of attributes affecting when buying bee products. The most important factor while purchasing bee products was quality (4.51). The second important factor according to the results was a previous experience (4.49) followed by the brand (3.73) country of origin (3.67) and price of bee products (3.52). Slightly fewer points got size/weight (3.50). The design of packaging (2.20) was evaluated as the least important attribute among the respondents. Promotion (2.31) of bee products had a small influence when buying. Based on the result of research made by Ványi, Csapo & Karpati (2009), it can be said that the factors influencing the honey purchase of respondents in Hungary were mostly price, type of honey, packaging and quality. According to the findings of Šánová, Svobodová, Hrubcová & Šeráková (2017), the price had an impact on consumer preferences and country of origin in the Czech Republic. Similarly, Guziy, Šedík & Horská (2017) evaluated the factors influencing the purchase of honey from respondents in Russia and Slovakia. The most important factors for Slovak consumers were the country of origin, followed by taste, type of honey and price. The size of honey was rated as the least important factor together with packaging and design. On the contrary, for Russian consumers, the most important factors were the type of honey, packaging design, price and taste. The conclusions of the study of Khauola et al. (2019) showed the fact that respondents in Morocco considered as the most important factors when buying honey mostly taste and country of origin. Overwise, according to Neto, Paiva & Santos de Novais (2020) when buying honey in Lower Amazon respondents consider as the most influential factors colour and texture of honey. On sample 200 respondents, Yeow, Chin, Yeow & Tan (2013) found that the factors of quality, health and price were evaluated as the main factors that influence consumers' shopping behaviour in Malaysia. However, the findings of a study conducted by Roman, Popliela-Pleban, Kozak & Roman (2013), revealed that the factors influencing the purchase of honey in Poland are primarily packaging specifically cleanliness, and sanitation of the packaging. Finally, Thoma, Kokthi & Kelemen-Erdős (2019) were investigating characteristics considered while buying honey in Albania and found out that the main factors were origin followed by taste and colour of honey.

Table 3. Factors influencing bee products purchasing decisions

Factors	Mean
Price	3.52
Country of origin	3.67
Quality	4.51
Brand	3.73
Size/weight	3.50
Place of purchase	3.05
Design of packaging	2.20
Material of packaging	2.37
Discount	3.10
Appearance	2.64
List of ingredients	2.87

Previous experience	4.49
Promotion	2.31

Source: own processing according to questionnaire survey (2021)

4. Conclusion

Sustainability and health trends are becoming increasingly relevant. The number of people who are looking for nutritious food products that will help them maintain and improve their health is growing. The importance of quality in product selection has been raised due to conscious eating habits. Similarly, the concept of sustainability has a strong impact on the customers. In addition, the beekeeping industry contributes significantly to the bioeconomy. Sustainable beekeeping is a concept that focuses its activities on environmental, economic and social objectives. It contributes to maintaining biodiversity. Moreover, sustainable beekeeping in the conditions of the Slovak Republic creates new options in the industry. To meet the main aim of the presented work, we used the collection of primary data through a questionnaire survey. Based on the findings, we can conclude that up to 96% of respondents consume bee products. 4% of respondents claimed that the main reasons were mainly disliked of the product and allergies. However, based on the findings of what bee products were the most consumed among the respondents, we concluded that the most frequently consumed bee product include honey. Other bee products, such as mead or propolis and bee pollen were evaluated as a rare consumption. We found that up to 90% of respondents consume bee products in the whole family. According to results the main reasons for consuming bee products were mainly to support the immune system and for its medicinal benefits. We found that the country of origin of bee products is important, as 62% of respondents considered bee products to be of better quality than from foreign producers. In the context of identifying the factors of importance that influence the purchase of bee products, we found that the most important factors include mainly the quality and previous experience. The respondents attach the lowest importance to the design of packaging, promotions and material of packaging.

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Selected Indicators of Foreign Direct Investment Inflows in Slovakia

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Abstract
One of the important key factors for the economic growth of developing countries around the world are foreign direct investments (FDI). Engaging FDI inflows through conductive policies has therefore become an important process in emerging markets. The prospect of new investing opportunities and excessive profits is supported by large capital inflows into various industries and segments. As a result, we have a competition between states in formulating flexible policies and providing incentives to attract private investors for more and more investment. In light of the above, the paper emphasizes the trends of FDI in Slovakia after economic reforms, the sectoral and national share of FDI, the way in which FDI affected the growth of the Slovak Republic economy. Various factors, that play an important role in attracting FDI to specific segments are included in this paper. The efforts of national governments to attract maximum foreign direct investment are also included in this research.

Key words*: indicator, investment, inflow, policy, forecast*

JEL Classification: *B22, E17, F62*

1. Introduction

Economic business relations globally are realized by the movement of goods and services at the international level, as well as by the international movement of capital and labour (Bende-nabende, 2017). One of the key aspects of business is foreign capital infiltration, which is brought into our economy in a form as a foreign direct investment (Piketty, 2017; Hintošová, 2021). In general, economic theory claims that investment is considered to be an economic activity in which an entity forgoes current consumption with a view to increasing the product in the future (Oldřich, 2014). Foreign investment is one of the many forms of realization of long-term international movement of capital (Papula, 2017).

We can define at the microeconomic level the indicators of FDI and the company's behaviour by product life cycle theory, which explains the various stages of the company's entry into foreign markets by dividing product life into stages - the process a product goes through from when it is first introduced into the market until it declines or is removed from the market (O'Meara, 2015; Gontkovičová, 2016). It is closely connected with an eclectic paradigm theory, also known as the ownership, location, internalization (OLI) model or OLI Framework, which is a three-tiered evaluation framework that companies use when attempting to determine benefits of foreign direct investment (FDI) impact (Mankiw, 2015; Xia 2018; Lomachynska, 2021). In general, however, the country must meet fundamental criteria for so called green field investment projects, for example political stability, a functioning legal system, macroeconomic stability and more, depending on the project type (Tintin, 2013).

All foreign direct investment projects are based on selected indicators or so-called determinants, which in most literature is divided by specific criteria such as - motivation of investors, target market, structure, sector, ownership and input (Muhammad & Khan, 2021). FDI can have a direct or indirect impact on a country's economy, including effects such as an

increase in employment, the transfer and development of technologies that will directly cause FDI (Yoshino, Taghizadeh-Hesary, Otsuka, 2020). These are mainly Greenfield investments, the effects of which can be measured directly or have measurable values, on the other hand the second group is caused by FDI (Rafat & Farahani, 2019).

We understand FDI as a complex concept and it is not clear to determine what impact the growth of investment inflows in the country will have on its overall economy (Bailey, 2018). On the other hand, from strategic point of view a company will always persuade own goals which creates positive and negative impacts, or even externalities (Secil, 2016). Therefore, it is up to strategic management planning to understand each individual indicator, or so-called determinant, and use it for these localization factors in creating goals, plans and strategic decisions with the opportunity to obtain more effective profitable results (Liargovas, 2012; Ali 2010; Pradhan, 2019).

2. Data and Methods

The main goal of the final work is to evaluate, based on scientific methods and information related to the problematic, the development and prospects of the inflow of foreign investment to Slovakia regarding strategic management planning. A set of individual sub-objectives was also chosen, which helped us to correctly evaluate the results of the work and achieve the set goal. Beside the main information line additional channels will support the observed data, including structures of different entities and data analysis. Once the information from other subjects is documented, the basis for the preview is obtained, which will lead to the final form of the final recommendations.

The work procedure is based on professional literature and scientific articles related to the issue, quarterly data provided by the NBS in the Macroeconomic Database (complemented by SARIO's annual reports for 2019 to 2020), followed by statistical and mathematical methods. Under these terms we used following procedure to work with our models, using Summary statistics, Correlation matrix, Regression analyses – in order to fullfill our hypothesis:

- Hypothesis 1 (H1): Foreign direct investments in Slovakia are influenced by Gross Domestic Product (GDP).
- Hypothesis 2 (H2): Foreign direct investments in Slovakia are influenced by Infrastructure Investments (SRaD).
- Hypothesis 3 (H3): Foreign direct investments in Slovakia are influenced by Trade openness (TrO).

2.1. Statistical and mathematical methods

In creating this work, we used the following methods and models, based on which we were able to obtain individual output data. These are the following procedures:

Summary statistics - are used to summarize a set of observations, in order to communicate the largest amount of information as simply as possible (Potter, 2010). In this work we used mean, median, mode, minimum value, maximum value and standard deviation.

Correlation matrix - A correlation matrix is simply a table which displays the correlation. The measure is best used in variables that demonstrate a linear relationship between each other (Faruk, 2013). The fit of the data can be visually represented in a scatterplot. We use the following excel formula:

= CORREL(OFFSET(firstvariable_range,,ROWS($1:1)-1),OFFSET(firstvariable_range,,COLUMNS($A:A)-1))

Regression analyses - The basic ordinary least squares approach is applied to the data, where the dependent variable y is Foreign Direct Investment, and , x_1, x_2… … … x_n are independent (explanatory) variables; ε represents a disturbance or error term which includes all other factors affecting y (Draper & Smith, 2014). We assume the errors are normally distributed with mean zero and unit variance. The estimated model is given by:

$$FDI = \beta_0+\beta_{(1)}\ GDP+\beta_2\ NX+\beta_3\ SRaD+\ \beta_4\ SoIC+\beta_5\ \ CPI+\beta_{(6)}\ PoSR+\beta_7\ QWaI+\ \beta_8\ VAT+\ \beta_9\ TrO+\beta_{10}\ U+\beta_{11}\ PAB+\ \neg\varepsilon$$

The FORECAST function in Excel is used to predict a future value by using linear regression. In other words, FORECAST projects a future value along a line of best fit based on historical data. Both functions calculate a future y-value by using the linear regression equation:

y = a + bx

Where the a constant (intercept) is: $a = \bar{y} - b\bar{x}$

And the b coefficient (slope of the line) is: $b = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sum(x-\bar{x})^2}$

The values of x̄ and ȳ are the sample means (averages) of the known x-values and y-values. (Suresh, 2020; Hyndman, 2020; Teodor, 2013). All information is supplemented by annual reports of government institutions dealing with foreign trade and investment issues together with the current wording of legislation.

2.2. Complementary sources of information

Non-scientific publications and articles on Internet portals, online discussion forums and online blogs on the topic. Internet resources, which at least partly related to this issue and thus helped to contribute to the publication. Graphic indicators of verified non-scientific publications, presentations or annual reports of small and medium-sized enterprises.

Current decrees or laws that have helped us to obtain information such as:

- Foreign Exchange Act of the National Council of the Slovak Republic no. 202/1995 Coll. Z., Foreign Exchange Act as amended
- Act no. 358/2015 Coll. Act on the Regulation of Certain Relations in the Field of State Aid and Minimum Aid and on the Amendment of Certain Acts (Act on State Aid)

3. Results and Discussion

Foreign Direct Investment in Slovakia averaged 234.43 EUR Million from 2004 until 2020, reaching an all-time high of 2101.80 EUR Million in June of 2006 and a record low of -1538.50 EUR Million in September of 2020. The COVID-19 pandemic is and will be a major slowdown in FDI inflows, especially between 2020 and 2021. As we can see for ourselves on the 2020 prep graph, it is really significant and will greatly influence the future development of individual determinants.

In 2019, net FDI inflows for Slovakia was 2,312 million US dollars. Though Slovakia net FDI inflows fluctuated substantially in recent years, it tended to decrease through 2000 - 2019 period ending at 2,312 million US dollars in 2019. Slovakia Foreign Direct Investment (FDI) increased by 58.6 USD mn in Dec 2020, compared with an increase of 258.1 USD mn in the previous month. Slovakia Foreign Direct Investment: USD mn net flows data is updated

monthly, available from Jan 2008 to Dec 2020. The data reached an all-time high of 1.2 USD bn in Dec 2008 and a record low of -1.8 USD bn in Sep 2020.

In 2019, the SARIO agency registered 116 investment inquiries with the potential to turn into an investment project. These are inquiries from companies that have expressed an interest in investing in Slovakia or in the long run, they are examining the country as a possible destination to establish its new operation. Inquiries came mainly from the following sectors: automotive, engineering, metalworking, electrical engineering, chemical industry, strategic service centers and information and communication technologies. SARIO Agency registered these inquiries most often from countries - USA, Germany, The United Kingdom, Japan, the Republic of Korea or China. Many companies are represented in this initial phase consulting companies and do not specify specific parameters their projects. In case the company shows a specific interest for investment in Slovakia there is a retraining of investment opportunities (demand) for an investment project.

3.1. State assistance for FDI and model specification

As of December 31, 2019, the SARIO agency had registered and 51 investment projects in progress, in the total volume of almost 5.7 billion with the potential to create more than 28,200 new jobs. This study is based on the data collected for 11 independent variables of foreign direct investment determinants for Slovakia in a period of quarterly data from 4th quarterly 2002 till 4th quarterly 2019.

Table 1. Comparison of the number and parameters of projects under development 2016—2020

	2016	**2017**	**2018**	**2019**	**2020**
Number of projects in progress	66	76	70	51	64
Potential work in progress projects	1.8 billion €, 23,800 new work positions	4,2 billion €, 31 000 new work positions	2,7 billion €, 24 000 new work positions	2,7 billion €, 24 000 new work positions	5,9 billion €, 31 230 new work positions

Source: own processing using SARIO annual report data

In this work we would like to find out about relationships between Inflow of FDI and selected determinants. We also will look for evidence in The Granger causality test if statistical hypothesis test for determining whether one-time series is useful in forecasting another. Out of 11 determinants used in this work we have selected 3 most significant. Quarterly data of selected determinants are later used as basis for forecasting. Forecasting model results are compared with annual reports of NBS and Ministry of Finance of Slovak Republic. In this work following determinants were used:

- GDP - Gross domestic product (GDP) is a monetary measure of the market value of all the final goods and services produced in a specific time period. The sign of the coefficient is expected to be positive.
- Trade openness (TrO) -in this study trade openness is computed as export plus import divided by GDP. The sign of the coefficient is expected to be positive.
- Market Size - GDP and Demography, Population of the Slovak Republic are used as a proxy of the market size. The sign of the coefficient for GDP and population growth is expected to be positive.

- CPI - the most well-known indicator of inflation is the Consumer Price Index (CPI), which measures the percentage change in the price of a basket of goods and services consumed by households. CPI is expected to be negative and significant.
- Demographic indicators linked to research -unemployment is often used as a measure of the health of the economy. It can go hand in hand with the Scientific research and development. More investments to research and development tend to lower unemployment. The sign of the coefficients is expected to be positive.
- Infrastructure - in this study Constructions and gross fixed capital formation are used as a measure of infrastructure. We expect both positive correlations with FDI coefficient.
- Subsidies - subsidies tent to indicate a healthy relationship to business stimulus. FDI as a part of business environment is expected to have positive coefficient.

Our data were subjected to regression analysis to describe the relationships between a set of independent variables and the dependent variable. Regression analysis produces a regression equation where the coefficients represent the relationship between each independent variable and the dependent variable. We used the standard regression formula with our data set as followed:

$$FDI = \beta\_0+\beta\_(1\ ) GDP+\beta\_2\ NX+\beta\_3\ SRaD+\ \beta\_4\ SoIC+\beta\_5\ \ CPI+\beta\_(6\ )\ PoSR+\beta\_7\ QWaI+\ \beta\_8\ VAT+\ \beta\_9\ TrO+\beta\_10\ U+\beta\_11\ PAB+\ \neg\varepsilon$$

Where GDP denotes gross domestic product, NX denotes net export, SRaD & SoIC denotes investment structure for research and infrastructure, CPI denotes as core inflation, PoSR denotes Slovak population, QWaI represents quarterly wages for all industries, VAT represents tax on production and import, TrO denotes as trade openness, U denotes for unemployment rate and PAB stands for total subsidies paid. Symbol ε represents a disturbance or error term which includes all other factors affecting y.

We used regression to determine the strength and character of the relationship between one dependent variable (FDI) and a series of other variables (known as independent variables). We will therefore take a closer look at the individual regression values. The Regression Coefficient is the constant 'b' in the regression equation that tells about the change in the value of dependent variable corresponding to the unit change in the independent variable . In our case only in VAT with coefficient 0,729182396 we can find a tendency which indicates a positive correlation, meaning that both variables move in the same direction together. A negative correlation can be seen in NX value -0,000296489, SRaD with value -0,000725967, SoIC with value -0,000317776, CPI coefficient value -0,103894129, PoSR with value -0,021216444 and PAB with value -0,000150919.

According to this regression model, which is presented in Table 1.0[1], our regression was 119.0603095 + 0.000308076x1- 0.000725967x2 + 1.09846E-05x3. According to P-value in Table 2, the intercept of our model is highly significant (0.001) < alpha (0.01) and is expressing that if GDP, SRaD and TrO would be equal to 0, then in that case the FDI inflow would be 119.0603095. GDP with its P-value in our model is highly statistically significant (0.005) < (0.05) and we can assume that every increase by 1 amount in GDP would increase the FDI by 0,000308076 units. On the other hand, the last indicators in our model were SRaD (0.78) > (0.05) and TrO (0.97) > (0.05) with its P-value, which is not significant in our model. So the statement that every increase by 1 in SRaD would increase the FDI by 0.000725967units and in the case of TrO by 1,09846E-05 is not reliable.

[1] Used determinants are gross domestic product – GDP, invest into scientific research and development SRaD and trade openess TrO

Table 2. Regression result of selected determinants

	Coefficients	P-value
INT.*	119,0603095	0,001046634
GDP	0,000308076	0,005128956
SRaD	-0,000725967	0,785613837
TrO	1,09846E-05	0,977581229

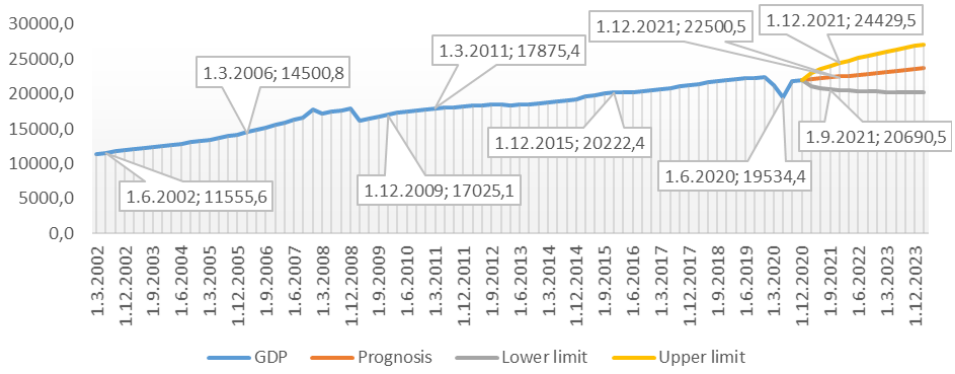
Source: own processing
*stands for intercept

Although our calculations did not bring any unexpected results, on the contrary, they confirmed that the inflow of foreign investment is a delicate matter and varies from project to project. The number of determinants that each project on the green field chooses is individual and directly proportional to the concept**.** Selected determinants, which were most significant in the model are Gross domestic product (GDP), Trade openness (TrO) and quarterly average wages for all industries (QWaI).

3.1. GDP expenditure method indicator forecasting

Public finances assume the drawing of the Covid reserve in the amount of more than 1 billion eur in 2021. From 2022 onwards, the assumption of structural consolidation at 1% of GDP per year. The drawdown of the RRF will begin in the second half of 2021 and will support the economy significantly in 2022. In the second half of the year, the beginning of the drawdown of the RDP, which spills over into stronger growth in 2022. It is therefore estimated that the next time horizon until 2024 will have the basic effect of drawing on EU funds.

Figure 1. GDP expenditure method selected values as of 1.12. of the year.



Source: Own processing

We compared our forecasts with the forecasts from the Ministry of Finance of the Slovak Republic according to Hagara E period 2020 -2023. The financial institute has estimated that the forecast will improve in 2020 thanks to stable consumption and a faster recovery in foreign trade. It also mentions slower growth for the years 2021 - 2022 due to strict measures, especially in the first half of 2021. In the second half of the year, the beginning of the drawdown of the RDP, which spills over into stronger growth in 2022.

Table 3.The slowdown in economic growth due to the second wave - Real GDP

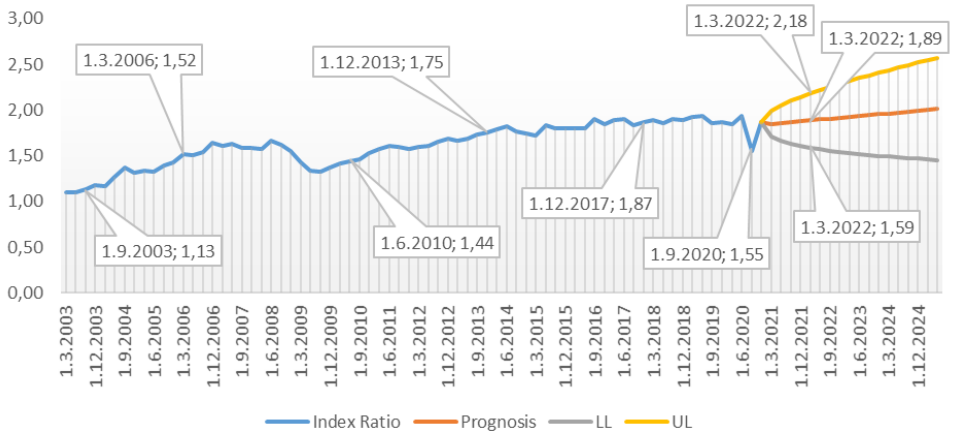
2019			2020			2021		
20_Sep	**21_Feb**	**Δ**	**20_Sep**	**21_Feb**	**Δ**	**20_Sep**	**21_Feb**	**Δ**
2,4	2,3	-0,1	-6,7	-5,8	0,9	5,5	4,3	-1,2
2022			**2023**			**2024**		
20_Sep	**21_Feb**	**Δ**	**20_Sep**	**21_Feb**	**Δ**	**20_Sep**	**21_Feb**	**Δ**
2,4	3,9	1,5	3,3	2,5	-0,8	-	0,7	-

Source: own processing according to data from Ministry of Finance of the Slovak Republic

3.2. Trade openness indicator forecasting

An empirical measure of trade openness is defined as the ratio of total trade to GDP, and represents a convenient variable routinely used for cross-country studies on a variety of issues. The development of trade openness and our subsequent forecast speaks of a slight decline, followed by an increase in 2019. In the absence of the COVID-19 pandemic crisis, the trade openness index would have a gradual increase. However, despite the secret pandemic, our indicator has managed to pick up and its future development will determine the degree of restriction of government institutions to exports and imports.

Figure 2. Trade openness indicator and selected values as of 1.12. of the year.

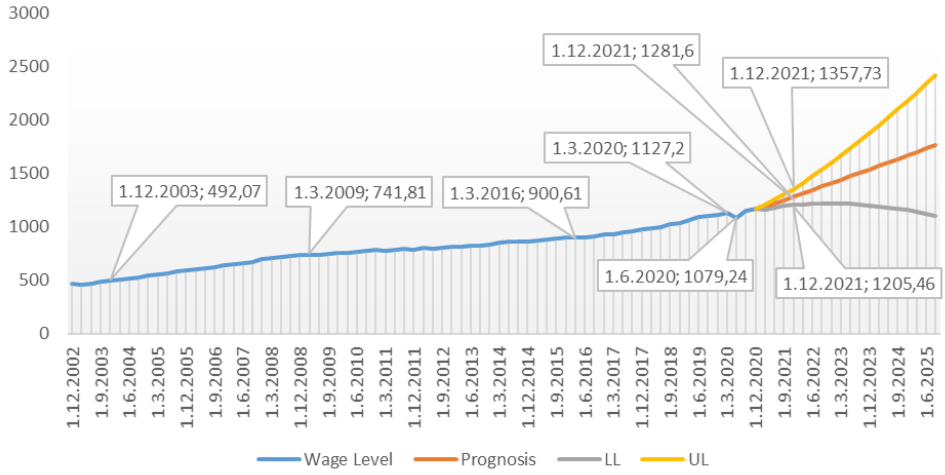


Source: Own processing

3.3. Quarterly average wages indicator forecasting

The average nominal monthly wage of an employee in the Slovak economy reached EUR 1,113 in the third quarter and increased by 4.2% year-on-year. After a unique decline in the nominal value of the average wage in the last quarter, monthly wages increased by an average of EUR 45 year on year in the third quarter. After taking into account the inflation rate, real wage growth reached 2.7%. Compared to the 2nd quarter of 2020, the seasonally adjusted average wage increased by 6.7%.

Figure 3. Quarterly average wages and selected values as of 1.12. of the year.



Source: Own processing

The volatile period caused by the Covid-19 pandemic in the third quarter has not yet had a significant impact on wage growth. The average nominal monthly wage of an employee in the Slovak economy reached EUR 1,113 in the third quarter and increased by 4.2% year-on-year. After a unique decline in the nominal value of the average wage in the last quarter, monthly wages increased by an average of EUR 45 year on year in the third quarter. After taking into account the inflation rate, real wage growth reached 2.7%. Compared to the 2nd quarter of 2020, the seasonally adjusted average wage increased by 6.7%.

The average wage in Slovakia also depends on the minimum wage. According to § 120 par. 4 of the Labor Code, the amount of the minimum wage entitlement for the relevant grade for the relevant calendar year for each hour worked by the employee at the established weekly working time of 40 hours is 1/174 of the amount of the minimum monthly wage entitlement. The monthly minimum wage valid in 2022 for the first level of work intensity is € 646, which is an increase of € 23 compared to 2021, when the minimum monthly wage was € 623. In 2022, the employee who will have a full-time job will be entitled to the above-mentioned monthly minimum wage of € 646.

Table 4. Overview of levies and advance payment of income tax from the employee's dependent activity at the monthly minimum wage in 2022 compared to 2021

	2022	2021	Difference
Monthly minimum wage (gross)	646 €	623 €	23 €
Contributions to the Social Insurance Agency (9.4% of gross wages)	60,72 €	58,56 €	2,16 €
Contributions to the health insurance company (4% of gross salary)	25,84 €	24,92 €	0,92 €
Advance tax on dependent activity	33,79 €	31,08 €	2,71 €

Source: own processing according to data from Ministry of Finance of the Slovak Republic

3.4. Selection of determinants according to green field projects

An important element in the selection of key indicators affecting FDI is always the nature of the investment plan of individual investors and companies. What is suitable for the IT segment, for example, may not be directly important for the logistics segment. Using 11 selected determinants, we found that the greatest influence on decision-making is classically the country's GDP, taxes, demography, living standards of the population and infrastructure. By establishing the hypothesis of causality between selected determinants, we found that not all determinants directly affect FDI and the regression model confirmed this. Which results in the

explanation, that not every FDI project requires the same criteria. The individual determinants influence each other and the fact that our lower numerical results mean extensive changes in the real system must be taken into account.

4. Conclusion

The inflow of foreign direct investment is a key factor in the development of the country's economy and strategic management decision process. The indicators of the inflow of foreign investment differ individually depending on the nature of investment projects. However, there are common determinants such as infrastructure, the country's GDP or the level of the minimum wage. In order for Slovakia to remain an interesting country for investment projects, it is necessary to continue to stimulate individual determinants and to support the inflow itself with the following points.

Using regression models, we demonstrated the individual causal relationships between determinants. We were also able to succesfully confirm all 3 hypothesis. These determinants (GDP, SRaD and TrO) are among few which are key factors in investment decision making proces in case of FDI. Moreover, we subjected selected determinants to the analysis of the prognosis until 2023 and thus gained the opportunity to point out the positive probable development of determinants despite the COVID-19 pandemic.

An important factor in the inflow of FDI is, for example, support from state institutions such as SARIO agencies or SBA agencies, their activity must continue to be supported. Significant determinants such as infrastructure, science and research and education or the technological maturity of the country must be the primary goal of our government. ICT communication channels must continue to be maintained and managed in such a way as to reduce the bureaucratic burden on all actors. Maintain the country's political stability and supporting small and medium size local businesses should also be recognize as primary points.

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Question of Expending Catering Online Business in the View of Sustainability

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Abstract

To meet the challenges posed by the COVID-19 pandemic, businesses have to face the reality is that the virus will become a pandemic issue we just have to get used to, rather than dreaming about putting the virus back in the bottle. As we move into the next phase, it's the time for a catering business to seek out and seize the opportunities emerging in the recovery somehow. Climate change is similar as immediate changes in some ways – a difficulty we have to plan for, deal with, and overcome every day. The daily risks businesses run with the Covid-19 pandemic may seem as much a part of normal daily life as the risks catering enterprises run when they drive or navigate business competitions. Although the vaccination and other prevention policies are controlling and reducing pandemic risks, their impacts are momentous in Visegrád Four (V4) countries, and the risks they cause should be evaluated in terms of catering to online business expansion. In this context, the purpose of the paper is to illustrate the negative impact of quarantine on catering operations, as well as to provide suggestions on catering online business expansion.

Keywords: *catering in V4 countries, online business, sustainability perspectives*

JEL Classifications: *J63, L14, L81, D00*

1. Introduction

1.1. Brief introduction

Since the outbreak of COVID-19, catering companies have suffered a massive direct impact. Most catering enterprises have been facing sharp declines in customer numbers, ruptured asset chains, and also other momentous challenges. The development of V4's catering industry was hindered by the influence of the pandemic, and various prohibitions led to the failure of the normal operation of restaurants. As a result, numerous restaurants closed or transformed because of the Covid-19 quarantine, especially the consistent and reiterative waves of a pandemic caused inevitable losses to the development of the catering industry, broken supply chain, labour shortage and deserted consumer market. It's notable that the influence of a variety of external factors, such as business ban, how to achieve sustainable management have been becoming the main factors for the catering industry to overcome.

In this paper, through interpreting and analysing a wide range of data about the catering industry in V4 countries before and after the pandemic, the demonstrations indicate the trends of catering/online business. Moreover, a few scenarios present some real-time challenges which the businesses have to face while combining with the current internal and external environmental factors in catering (online) business. Further, the SWOT analysis method is implemented to verify whether the expansion of online business is an appropriate business decision for the catering enterprise to achieve its sustainable operation.

The analysis results show that the turnovers of V4 countries catering industry have declined regarding the product supply and internal operational risks caused by the business ban during the pandemic, as well as suggest that better expand their online business is significant to meet business goals from sustainable perspectives.

1.2. Background

1.2.1. V4 countries catering industry under the epidemic

Based on Eurostat (2021), Hungarian central statistical office (2021), Website of Republic of Poland (2021), and Covid Portál (2021) mention that the overall trend of the number and turnover of the catering industry in V4 countries has raised steadily before 2019, however, since 2019 there has been being a decrease in the number of catering enterprises and a continuous decline in turnover due to the impact of the pandemic. The ban on COVID-19 has led to the failure of many restaurants in V4 countries to operate normally. First of all, for example, the pandemic prevention policy issued by the Hungarian government repeatedly imposed restrictions on the operating time of the catering industry and the dining standards of guests. Secondly, as Márton (2021) and Vakcinainfó (2021) discuss that due to the reducing number of foreign tourists in Hungary, which led to a decline in the number of consumers in Hungary to the catering industry, which also affected the decline in turnover and other factors. Therefore, consequently, many Hungarian catering enterprises have to directly decide to pause business or close down. Besides, meanwhile, the catering enterprises in Poland and the Czech Republic have been similarly experiencing the challenges as Hungarian catering enterprises (Website of Republic of Poland, 2021. & Covid Portál, 2021). In addition, Slovak catering companies have also been hit by quarantine, but they noticed a significant increase in online and delivery order turnover in 2021 (Statistical Office of the SR, 2021).

1.2.2. Online business background of the catering industry

Although every operation link of the catering industry has been seriously affected by the pandemic, there is no denying that challenges and opportunities always go hand in hand, and enterprises are always able to find a new way out for survival. As a result, the pandemic has prompted enterprises all over the world to innovate for overcoming the crisis of sustainable challenges. Improving existing services and creating new services are also the main strategies to deal with the crisis (Heinonen & Strandvik, 2020). Under the ban on social distance and isolation in various countries, setting up and expanding online business in the form of takeout is also a prompt service innovation in the catering industry. At the same time, in the face of the global crisis brought about by the pandemic, people have accepted and adapted to ordering services online are also core values of digitization and sustainable development with online catering business (Heinonen & Strandvik, 2020).

Moreover, online sales in the catering industry not only provides more convenience for customers who are isolated from home during quarantine but also catering online business are empowered to develop various services through their platforms. As the results of a study on crisis response strategies in high-end restaurants in Germany, it addressed that restaurants sell services, sell vouchers and engage with promotion activities to get through this period (Wilkesmann & Wilkesmann, 2020). Therefore, it's apparent to see digital service transformation is one of the important strategies for catering enterprises to achieve sustainable development during the epidemic period and even after the epidemic.

1.3. Challenges of Catering online business

Although catering online business provides more opportunities to develop business operations, there are also many factors they may positively and/or negatively affect online sales, such as business strategies, marketing strategies, and human resources. First of all, as Max (2019) mentions that with regard to storage and procurement, under the epidemic, some business strategies are inclined to hoard a large number of goods, but hoarding will lead to the risk of space, liquidity, labour and theft, as well as some businesses are in short supply because of the

breakage of the supply chain. Secondly, when the catering enterprises have sufficient inventory and are ready to publish products, they will face choosing online sales platform, through this marketing strategy which needs to consider whether the order issuing experience of the sales platform, as well as distribution services and word-of-mouth, are competitive. In recent years, scholars have done a lot of research on electronic Word-of-Mouth (eWOM) (Cheung, Luo, Sia & Chen, 2009). Because of the rich content and credibility, it affects the customer's attitude towards the productions (Abubakar, Ilkan, Meshall Al-Tal & Eluwole, 2017), also customer evaluation has a direct impact on the turnover of the catering industry. In addition, whether the relevant information of takeout products on the web page is detailed and attractive, as well as the enterprise's own brand image, popularity and so on.

Besides, at the same time, enterprises also need to face the problem of human resources management. Due to the impact of the epidemic, the relationship between employers and employees has become increasingly tense. In the face of online transformation, online management and leadership of employees will be more difficult. When the relevant work instructions are realized by remote technology, the withdrawal behaviour of employees at work will be shown in terms of attention and self-control (Chadee, Ren & Tang, 2021). As management decisions play a key role in dealing with chaos, seeking an appropriate strategic response has become the primary challenge for managers in the catering industry (Baden-Fuller & Teece, 2020).

2. Data and Methods

By demonstrating and visualizing the data from a wide range of data warehousing about catering/online business in V4 countries, this paper compares and describes catering/online business changes before and after the pandemic, in order to evaluate and predict its trends in the V4 countries in post-Covid 19. Moreover, as interpreting the proportion of online shoppers in the European Union and V4 countries, the study illustrates the trend that the expansion of online business in the catering industry is a considerable business strategy for enterprises to achieve sustainable progress under the influence of the epidemic.

Further, the study critically discusses a few factors influencing online catering expansion, such as business strategies, marketing strategies and human resources. Finally, through SWOT method, it provides a clear picture regarding advantages, challenges, and opportunities of expanding online business to the catering industry.

Hypotheses:

- To meet the goals of this study, the next step will focus on the statistical and critical analysis of the resources drawn on, as well as we put forward the following assumptions to guide and support this paper.
- *H1*. The epidemic led to a serious drop in turnover in the V4 countries catering industry.
- *H2*. The expansion of the online business will help the catering industry to adapt to the social development of the post-epidemic period.

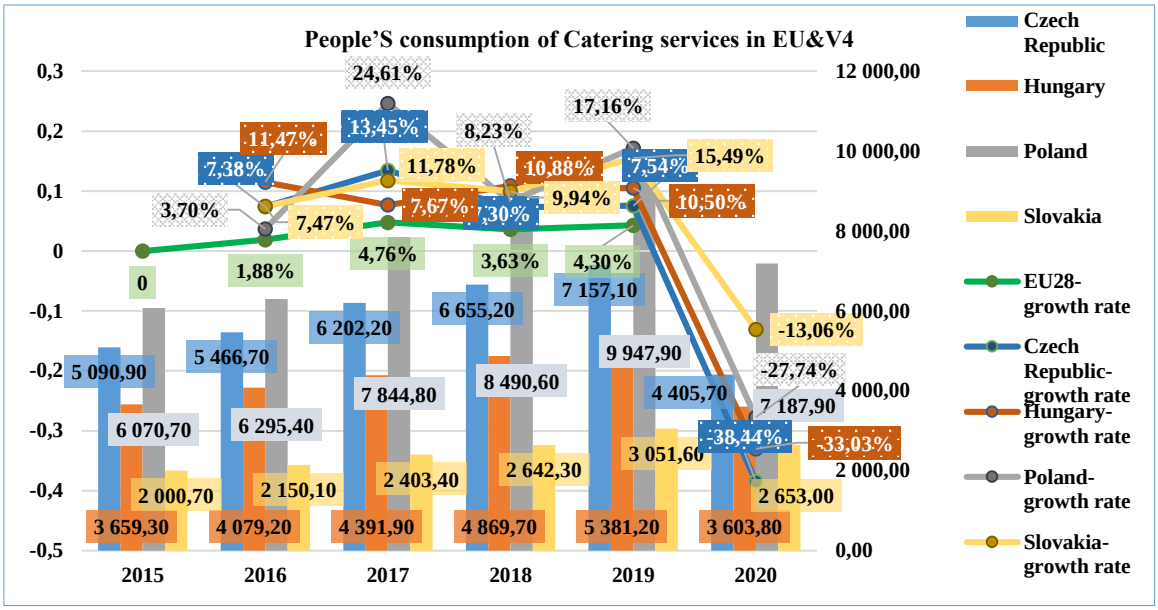
3. Discussion

3.1. Data Description

V4 countries data description of turnover and number of their catering enterprises are as follows:

(1) The consumption of European Union and V4 countrymen in Catering services

Figure 1. People's consumption of Catering services in EU and V4 countries

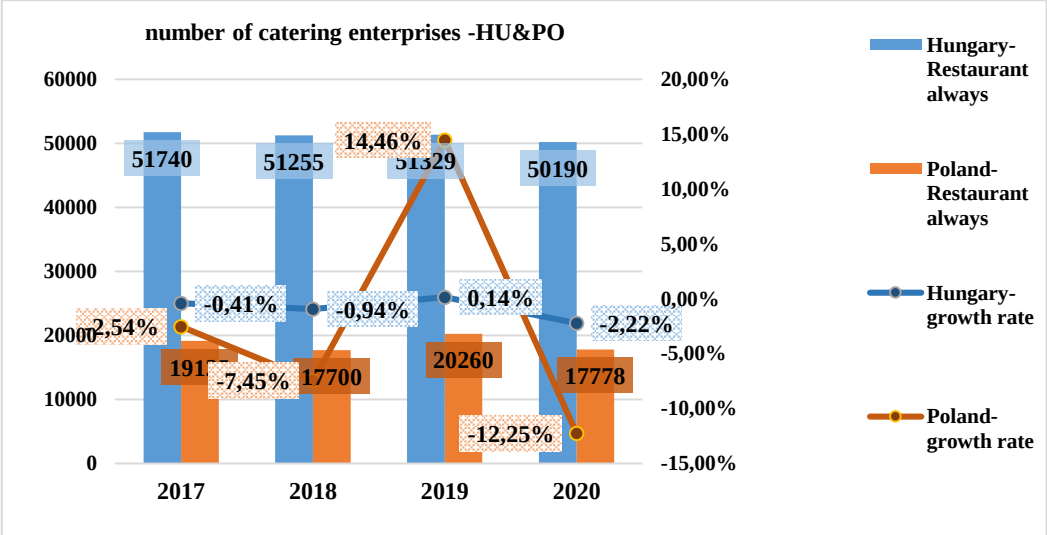


Source: Own construction by Eurostat (2021)

The data in figure 1 show that people in the European Union spent about 584109 million euros on the catering service industry before 2019 and maintained an average annual growth rate of 3.6%. But at the same time, the turnover of the catering industry in V4 countries was generally higher than that in the European Union. Before 2015, V4 countries generally showed a sharp rise in 2017, of which only Hungary's catering turnover growth rate was less than 10%, but also higher than the 4.76% achievement of the European Union. V4 countries began to rise slightly in 2019 after a slowdown in 2018, with Poland having the highest turnover growth rate of about 17.16%. However, there has been a sloping decline in V4 countries since 2020, with the Czech Republic suffering the worst losses, with a turnover growth rate of -38.44%, followed by Hungary at -33.03%, and Slovakia, with the lowest decline rate by -13.16%.

(2) Changes in the number of catering enterprises in Hungary and Poland before and after the epidemic

Figure 2. Number of catering enterprises operating in Hungary and Poland

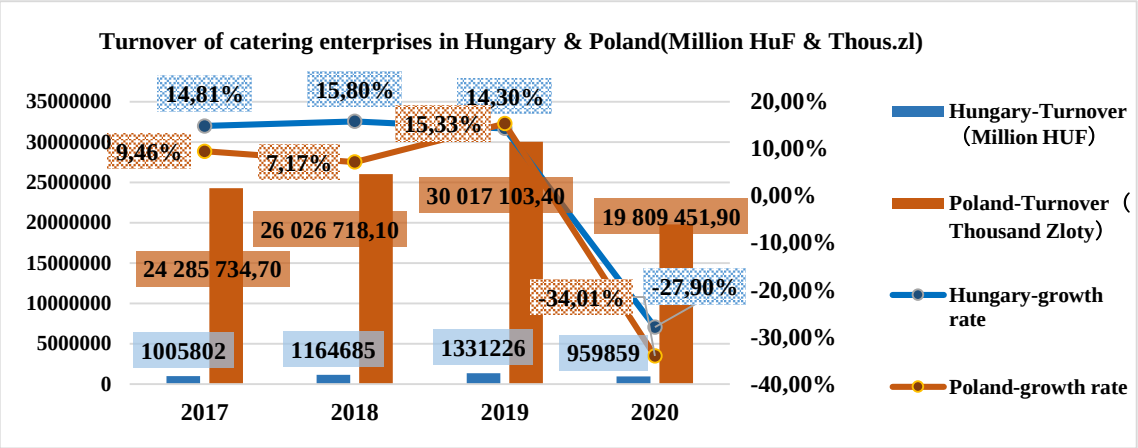


Source: Own construction (2021)

From figure 2 above, we can see that the number of restaurants open in Hungary showed an unprecedented negative growth of 2.22% in 2020, which shows that 1139 restaurants closed during this period. On the other hand, the number of catering enterprises in Poland has changed even more, with a negative growth rate of 12.25% from 14.46% between 2019 and 2020. About 2482 catering enterprises in Poland closed down in 2020.

(3) Changes in turnover of catering enterprises in Hungary and Poland before and after the epidemic

Figure 3. Turnover data of catering enterprises in Hungary and Poland



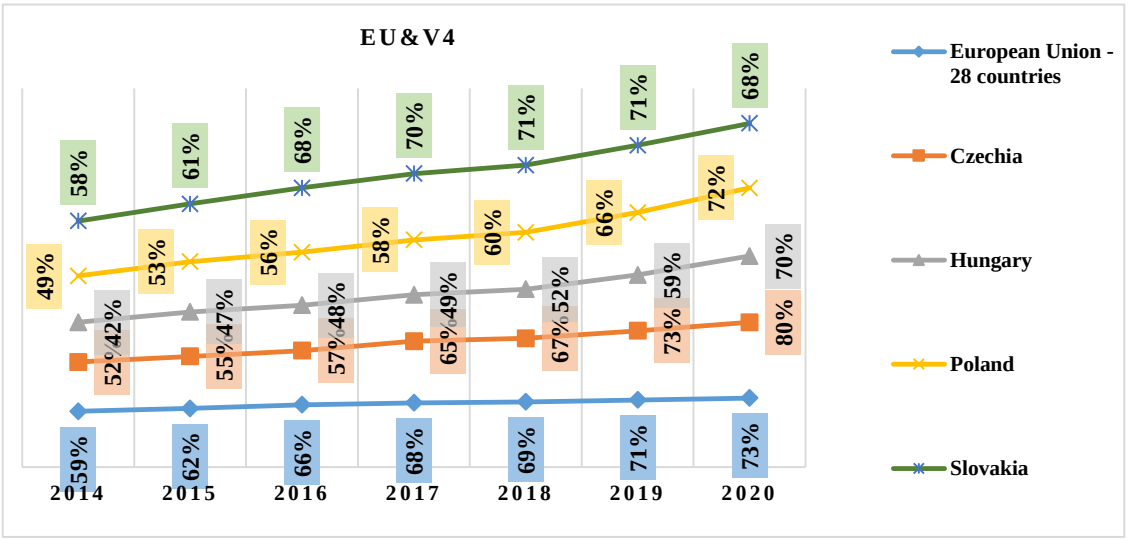
Source: Own construction by Eurostat (2021)

As shown in figure 3 above, the turnover of the Hungarian catering industry has grown at an annual rate of more than 11.97%, but by 2020 its turnover has fallen by 27.9%. The decrease is about 371367 million HUF.

In the turnover data of Poland, the trend is the same as that of Hungary, but the decline rate is much higher than that of Hungary. The turnover of Polish catering enterprises fell by 34.01% in 2020.

(4) The proportion of online shoppers in the European Union and V4

Figure 4. The proportion of online shoppers in the European Union and V4



Source: Own construction by Eurostat (2021)

It can be seen from figure 4 that the proportion of online shopping in the European Union and V4 countries is increasing every year, of which the proportion of online shopping in the

European Union shows a small and steady increase every year, maintaining an upward rate of 2% during the two years from 2018 to 2020. The European Union grew by 14% in just six years from 59% in 2014 to 73% in 2020. In the V4 countries, the Czech Republic rose from 52% in the initial 2014 to 80% in 2020, which is generally higher than the growth rate of the proportion of online shopping in the European Union and is the country with the highest proportion of online shoppers in the V4 countries. In addition, in 2020, the lowest number of online shoppers in the V4 country was Slovakia, accounting for about 68%, but 5 percentage points less than the overall share of the European Union. In addition, Hungary accounted for about 42% of online shopping in 2014, the lowest in 2014, but it almost caught up with the overall level of the European Union in 2020, reaching 70%. The proportion of online shoppers in Poland has also reached 72% in 2020 with the overall development of the European Union.

3.2. Factors influencing catering online business expansion

Due to the COVID-19 quarantine, both the macroeconomic and microeconomic aspects of society have been affected (Finsterwalder & Kuppelwieser, 2020). The new challenges facing public and private organizations are the reevaluation of the market and the restructuring of business operations (Mora Cortez & Johnston, 2020). Also, as Ahrens and Chapman (2002) explain and/or predict business strategies, marketing strategies and human resources all drive significant factors to meet the business goals of the catering business.

First, business strategy guides the decision-making process for resource allocation, like food characteristics, customer positioning, distribution methods (Ahrens & Chapman, 2002). For example, in the supply chain link of the operation of products, qualified inventory management can ensure that the supply of goods is adequate and that there is no shortage of oversupply (Singh & Verma, 2017), adequate inventory can help enterprises to cope with market uncertainty to a certain extent (Jammernegg & Reiner, 2007). Moreover, the supply chain problem can be avoided by optimizing inventory management, to solve the supply problem in the business strategy of the catering industry.

Second, mindful marketing strategies provide more opportunities to meet customers' needs and attractions (Ahrens & Chapman, 2002), which regard to website construction, brand effect, electronic Word-of-Mouth (eWOM), promotion methods, special offers, points exchange, invitation cashback, after-sales service. In the online marketing plan, the description of product information and customer rating is particularly important, in which the description of the information directly affects the customer's choice, such as the setting of the product name. From Wansink (2001) and his colleague's discussion, the menu name is changed from the simple "zucchini biscuit" to the more descriptive "Grandma's zucchini biscuit". The order of the revised product increased by about 27%.

Furthermore, about customer ratings, when shopping online, people will choose the top products according to the sales volume and score of the products. Service, experience, food and location constitute the four main attributes that affect the restaurant eWOM (Luo & Xu, 2021). Results from Nielsen show that eWOM is the second most trusted form of advertising, with 70% of respondents saying they trust eWOM, with an increase of 15% in four years (Grimes, 2012). The relevant research from Wang (2021) and his colleagues also confirms once again that review volume and review rating have a great influence on restaurant choice and restaurant profitability. As the above discussion, they indicate an awesome factor which businesses are able to boost their competition and online catering business through their daily operation.

Finally, appropriately human resource allocating enables to reduce labour costs and market labour supply, as well as to expand sales channels for catering online business, examples as employee management and leadership, reward, salary, working time and functional arrangement (Ahrens & Chapman, 2002). Each restaurant has a different job layout, and these

posts or functions will change and adjust with the passage of time and the development of society. However, the strategy to achieve online business expansion is inseparable from the cooperation of every employee and every position. Better cooperation of work positively supports to improve the efficiency of employees at work, as well as their commitment to the organization and job satisfaction (Kara, Uysal, Sirgy & Lee, 2013). During the epidemic, the work performance of the restaurant staff will directly affect the consumer experience and thus the development trends of the restaurant. Therefore, how to allocate human resources and employee performance appraisal and understand their work and living conditions during the epidemic can improve job satisfaction (Kim, Woo, Uysal & Kwon, 2018).

3.3. SWOT analysis

As above addressed, to clarify an easy following picture is supportive to develop a full awareness of all the factors involved in considering the catering online business expansion. Here, by applying a SWOT analysis, the study seeks recommendations and strategies with a focus on leveraging strengths and opportunities to overcome weaknesses and threats.

1. **Strengths**: Online business adapts to the consumers' habits and needs, social and environmental concerns of V4 countries people during the post-epidemic period.
2. **Weaknesses**: The catering industry is lack online management experience with a quarantine background, and enterprises rely on the traditional online business model.
3. **Opportunities**: The ban during the pandemic period has provided a new sales market for online businesses.
4. **Threats**: Most of the competitors already have the brand effect and have occupied most of the online market ahead of time.

4. Conclusion and Suggestion:

Through the study of this paper, it indicates that the pandemic has been leading to a serious decline in the turnover of the V4 countries catering industry. While facing the challenges with the rupture of the supply chain, poor management of human resources and the lack of online operation strategy can significantly affect the turnover of the catering industry, catering enterprises are empowered to expand their online business, the enterprise enables to develop their online business from the aspects of the product supply chain, online product advertising, electronic Word-of-Mouth and optimizing employee management. Afterwards, by the SWOT analysis, this paper exams the benefits, drawbacks and opportunities of online catering business, as well as predicts that the expansion of the online catering business is conducive to the social development of the catering industry to adapt to the post-epidemic period.

To this end, V4 countries catering industry in the current expansion of online business empowers enterprises in the post-epidemic period to adapt to the social environment so as to achieve their future sustainable management.

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Managing of Household Food Waste to Achieve Sustainable Food Security - A Review

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Abstract

Food waste both precooked and leftover is a biodegradable waste which occurs from farm, food processing industries, food services up to household level. Food waste still manages to be a challenge in terms of sustainability and food security, because it embodies the sum of resources used to produce uneaten food, including cropland, agricultural chemicals like fertilizers and pesticides, irrigation water and relates to three major world problems: food security, greenhouse gas emissions in the food supply chain, and waste disposal. It has a direct effect on the main environmental issues and economical aspects. Various aspects contribute to this waste poor handling, inadequate transport or storage, lack of cold chain capacity, extreme weather conditions to cosmetic standards, and a lack of planning and cooking skills among consumers. A major share of food waste is generated in households. This review aims to give some summarized data for future researcher for the consumer food waste behavior, factors affecting household food waste, management of household food waste and end up with some recommendation for the routines we can take to reduce household food waste.

Key words: *Food security, food waste, household, management,*

JEL Classification: *Q5, P32, P42*

1. Introduction

Food waste (both precooked and leftover) is a biodegradable waste discharged from various sources including food processing industries, households, and hospitality sector (Paritosh., Kushwaha, Yadav, Pareek, Chawade, & Vivekanand, 2017). Food waste is an important indicator of sustainability because it embodies the sum of resources used to produce uneaten food, including cropland, agricultural chemicals like fertilizers and pesticides, irrigation water and relates to three major world problems: food security, greenhouse gas emissions in the food supply chain, and waste disposal (Conrad, Niles, Neher, Roy, Tichenor & Jahns., 2018; Cronjé, van der Merwe & Müller, 2018). If only one-fourth of the food wasted could be saved, it would be sufficient to feed all currently undernourished people (Irani, Sharif, Lee, Aktas, Topaloğlu, van't Wout, & Huda., 2018). Based on United National Environmental Program (UNEP) Food Waste Index Report, around 931 million tons of food waste was generated in 2019, 61 per cent of which came from households, 26 per cent from food service and 13 per cent from retail. Several studies conducted in countries such as Germany, Italy, Switzerland and or in the European Union unanimously indicate private households as main contributors of food waste (Schimdit & Matthies., 2018). This food waste also results in the waste of natural resources, energy, capital and time; and has destructive effects on the environment, society, and economy and threatens global food security (Schanes, Dobernig, & Gözet., 2018). It occurs in every stage of the supply chain and there are many factors that lead to food loss, but one of them which has bigger impact is consumer behavior towards wasting food.

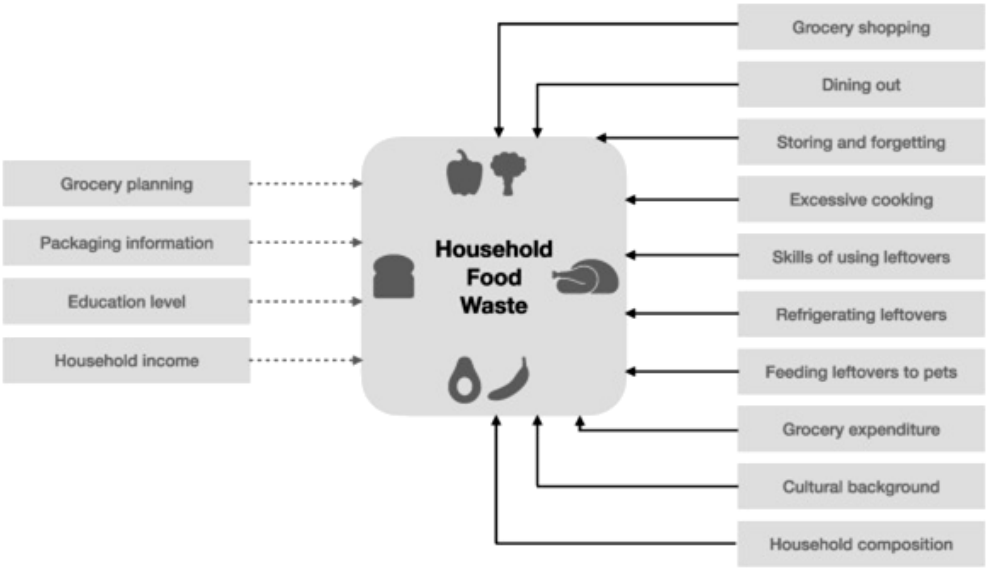
This review aims to give some summarized data for future researcher for the consumer food waste behavior, factors affecting household food waste, management of household food waste

and end up with some recommendation for the routines we can take to reduce household food waste.

2. Factors affecting household food waste

Keep/waste decision is not always a straightforward one. It is an economic decision, with both costs and benefits; the outcome depends on several contextual factors as well as individual-level characteristics (Ellison & Luks., 2018). A multitude of variables that have an influence on household food waste, include psychological factors (e.g. attitudes towards food waste, habits, capabilities, knowledge), social norms, situational factors, and socio-demographic characteristics (e.g. gender, age, socio-economic status), (Aschemann-Witzel, Gimenez & Ares., 2019). Retail market also has an impact on household food waste is associated with how food products are being sold, their prices, their packaging and their labels (Yaqub, 2016).

Figure 1. Behavioral and socio-demographic determinants of household food waste- Lines with continue lines indicate significance relationship



Source: Ananda, Karunasena, Mitsis, Kansal, & Pearson., 2021

2.1. Socio-Demographic factors

Socio-demographics factors including age, family size and composition, and household income have been explored as antecedents to food waste behaviors (Ananda et al., 2021). When there is greater consumer choice and greater share of income available for food according to Di Talia, Simeone, & Scarpato (2019) increases undoubtedly food waste. However, according to Di Talia, (2019) income does not affect the food waste but it depends on knowledge that people have regarding to food waste. Based on their knowledge it was pointed out that men waste more than women, those who had a higher level of education were unlikely to waste food, different reasons why the food was wasted (non-use of food, it was not suitable to be stored because of the package or surplus food purchases were not consumed by consumers). In this research was also pointed out the shopping frequency and shopping list before going to do shopping and that shopping at long intervals increases the tendency to generate domestic food waste because it leads to buying products that are not really needed at the time.

Fami, Aramyan, Sijtsema, & Alambaigi., (2019) discussed that household size has a direct positive effect on total food waste in Tehran city. Big families waste relatively more food than

the small ones with explanation that the more people the higher the level of food waste. In Hungary persons belonging to the following sub-groups are more wasteful than other members of the category group marked within parenthesis: men (gender), live in capital city (habitation), aged between 30-39 (age group), three-person household (household size), have child under 14 (child under 14 years), have above average income (level of income) (Szabo-Bodi, Kasza & Szakos, 2018). However, based on the same study the total amount of avoidable food waste per capita per week tends to be more in higher income households than in poorer ones.

2.2. Food safety concerns

Food safety concerns are a key reason U.S. and European consumers throw out food (Ellison & Luks, 2018). Waston & Meah (2012) explore the tensions between concerns for food waste and for food safety when translated to domestic practice. According to them on the one hand, campaigns to reduce the astonishing levels of food waste generated in the UK moralize acts of both food saving (such as keeping and finding creative culinary uses for leftovers) and food disposal. On the other hand, agencies concerned with food safety, including food-poisoning, problematize common practices of thrift, saving and reuse around provisioning. Kasz, Szabo-Bodi, Lakner & Izso (2019) conclude that balancing between the desire to decrease food waste and requirements of food safety requires a constant work to educate both consumers and food entrepreneurs and the involvement of food chain safety authority system with new ideas and ability to react – and in many cases, adapt – quickly to the changing market situations is very important.

3. Consumer food waste behavior

Consumers are the ones who play the main role in terms of food loss. Household food waste is determined by consumers' behavior along a series of stages: from planning, food purchase, storage, preparation, consumption, to final disposition (Aschemann-Witzel et al.,019). Ajzen (1991) used the Theory of Planned Behaviour (TPB) as a good tool with a strong basis for explaining the behaviour of the consumer on food-loss based on the factors such as: attitudes, norms, perceived control and intentions on the behaviour. Based on many researches made for food waste it helps us understand that there are other factors which affect waste food. Aktas, Sahin, Topaloglu, Oledinma, Huda, Irani, Sharif, van't Wout & Kamrava, (2018) highlighted the factors that play an important role in terms of the loss of food and they are: food choice motives, financial attitudes, planning routines, social relationships, food surplus, or food consumption habits across specific periods of the year (Ramadan period). Based on TPB Aktas et al., (2018) suggested many positive relationships which affect food waste such as: relationship of attitude to intensions, when somebody feels bad for throwing away uneaten food they are more likely to waste food, a positive relationship between subjective norms to intensions, if one's close friends and family think food waste should be reduced, then their intention to reduce food waste will be higher, the positive relationship from perceived behavioral control to food waste behavior, the impact of food choices motives or financial attitudes to planning routines, planning routines to food surplus, social relationships to food surplus, food surplus to food waste or food consumption habits across specific periods of the year (Ramadan) to food waste.

Despite the growing number of studies on this topic, no systematic literature review (SLR) has yet been conducted on the determinants of consumer food waste and the factors that trigger or inhibit wasteful behavior at household level (Graham-Rowe, Jessop, & Sparks, 2014). A systematic literature review of household food waste behavior using the SLR approach was carried out by Principato, Mattia, di Leo, & Pratesi., (2021) in order to increase knowledge on

food waste and to create the household wasteful behavior framework which was based on consumer decision making process. According to Principato et al., (2021) food waste behavior can be affected by personal characteristics such as: socio-economic, psychological, social, situational and demographic factors. It was emphasized the role of these factors not only on household food waste journey which includes planning, provisioning, storing, preparing, consuming, disposal by van Geffen, van Herpen, & van Trijp, (2020) based on Boyd & McConocha, (1996) but also the buyer decision process such as: planning, pre-acquisition, acquisition, preparation, consumption and disposition.

Many studies that have been conducted emphasized the main role in the food-related behaviors changes occur due to cognitive aspects. However, evidence suggests emotional, rather than cognitive, appeals may be a fruitful avenue for reducing food waste (Septianto, Kemper, & Northey, 2020). Gratitude makes consumers notice and appreciate the positives in life Wood, Froh, & Geraghty, (2010). Septianto et al., (2020). used gratitude ('for having' vs. not having) and loss vs. gain) as an important emotion which helps consumers reduce food waste by raising the awareness of people to be grateful for what they possess (food) and emphasized the important role of how messages are framed in campaigns to arise people awareness and establishing processing fluency as the mediating factor which under lies emotion effects and identifies the moderating role of emotions on the effectiveness of gain and loss frames.

Another aspect which affects consumer behavior towards food waste according to Ghafoorifard, MacDonnell & Basil (2021) is economic hardship. However, in the end of this research it was concluded that it has a negative relationship between economic hardship and food waste but what leads to food waste it is the impact that economic hardship has on ontological insecurities of consumers' food-related behavior especially in unusual situations such as the recent Covid-19 pandemic leading them towards over-consuming and wasting food.

4. Manage of household food waste

Often purchasing in bulk and purchasing the incorrect products contribute significantly to food waste. A process as simple as better planning of meals could decrease some wastage as this was prevalent to food waste in a case study in Kimberley, South Africa, Cronje (2018). According to Paritosh (2017) conversion of food waste into energy via anaerobic processes in terms of methane is economically viable and could contribute to food waste management. Packaging and its functions may play a significant role for the amount of food waste in households where effective packaging can reduce food losses both directly and indirectly (Williams, Wikstrom, Otterbring, Lofgren & Gustafsson, 2012).

Focusing on changing the routinised food behavior (grocery shopping and meal preparation) of households could help on reduced household wastage. For example, new innovations in food storing can help households to keep a track on stored food and use them before the expiry date (Ananda et al., 2021). Another contributing point in managing food waste has to do with manufactures. Evidence suggests that even small increases in shelf life could result in a significant reduction in food waste at the household level (Toma, Costa, & Thompson., 2020).

5. Conclusion and recommendation

This review points out the main factors affecting food waste in households: starting with socio-demographic factors, food safety concerns and ending up with the costumer's food waste behavior. It also gives some data of managing household food waste. There are simple routines that we can take in order to prevent household food waste as: plan your buying list, plan the amount of food you are cooking, get used to eat leftover foods of previous meal, do not make

food reserves in your fridge or your food storage room, make a routine of first in- first out, store food properly. We believe that considering the abovementioned daily routine recommendation, will contribute to reduce the food waste in household level.

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Analysis of the Cocó Park and its Importance as Urban Green Infrastructure for the City of Fortaleza.

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Abstract

Given the context of urbanization in Brazilian cities, we see an increasingly vital attempt to advance sustainability ideals and preserve the remaining green spaces through the occupation process. Problems derived from significant urban development are widespread, including changes in the local microclimate, regional plant and animal species reduction, and the need for major urban drainage infrastructure works, among others. However, we can always find areas of great importance to cities; urban parks are examples of these spaces. Based on this, the research proposes to identify the importance of the role of urban parks as a structural part of the green urban infrastructure network in the city of Fortaleza, analysing its positive and negative points on the urban scale through the observation of one object of study, the Cocó park with data collection in thesis and published articles, field visits, analysis of maps and aerial views, economic and social statistics. Thus, through a swot analysis, enabling a review of the current situation of the green urban infrastructure of Cocó Park, projecting an overview of Fortaleza city's conditions.

Keywords: *Urban Park, Urban Green Infrastructure, Landscape architecture, Sustainable development.*

1. Introduction

Fortaleza is one of the largest cities in Brazil, located in a coastal area north of the country, a geographical situation that generates important natural environments for urban sustenance, but which also has a context of political, social, and economic conflicts.

Due to its proximity to the ocean, Fortaleza has transition ecosystems that accompany the watercourses within the continental mass until its last stop. These environments are of great relevance given their natural context, two urban parks are found respectively, which will then be analysed, communicating linearly across the Cocó river, but they have different natures and histories. They are called Parque do Cocó and Parque da Sabiaguaba.

This study aims to analyse the green infrastructure of the city of Fortaleza through the Cocó park in the Municipality, identify what makes it necessary for the urban green infrastructure network and society in the city, and understand its social, urban natural connections with the existing urban fabric.

The general objective of the research is to study the urban green infrastructure of the city of Fortaleza through the analysis of one crucial urban Park in the Municipality of Fortaleza, the Cocó Park, identifying the importance of urban parks for structuring the green infrastructure network in the city and understanding the social, urban, and natural connections existing between Cocó Park and the city of Fortaleza.

2. Data and Methods

For this article, research was conducted using a few doctoral theses, scientific articles, research in manuals from organs of the Municipal Government of Fortaleza and the State of Ceará, and information related to community forums and public presentations on State Government websites with information on geographic, social, and economic statistics. Available information regarding GIS and aerial images in the Municipality and the State data collection was gathered. Empirical data collected in person with technical visits and analysis in aerial images of Geographic Information Systems were used as well.

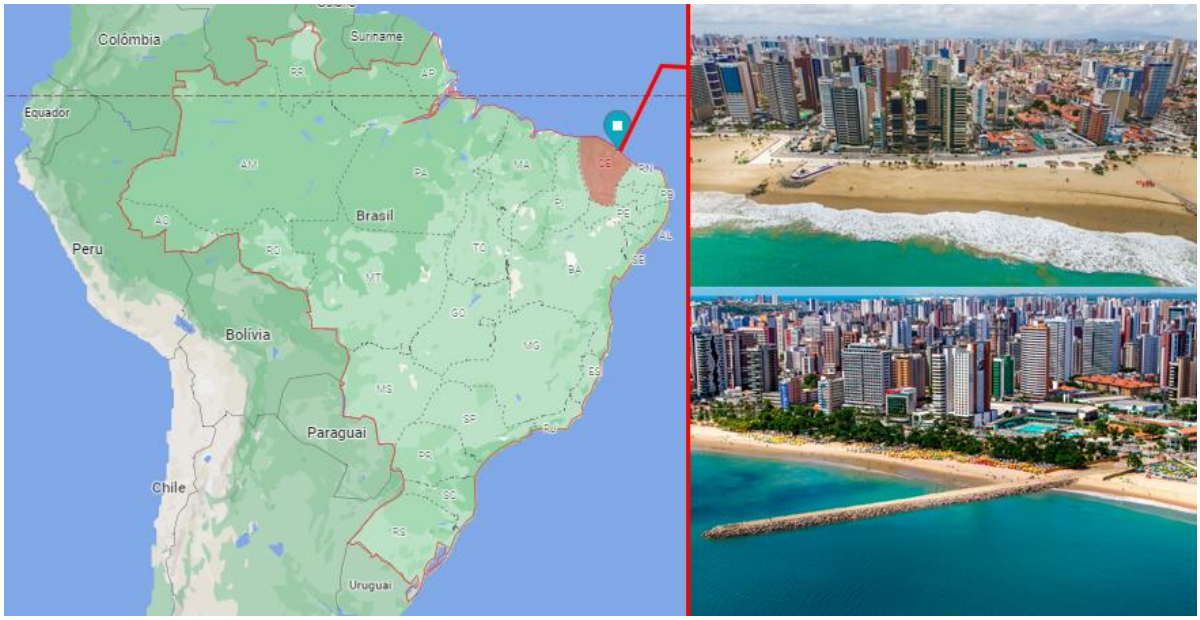
3. Overview

3.1. Fortaleza city within the Brazilian context

Fortaleza is the fifth most populous city in Brazil and capital of the State of Ceará. The Municipality has around 2,687 million inhabitants and has 314,930 km². Regarding the Municipality's gross domestic product, the agricultural services and industry sector has always had great importance in the economy in general for years. This is also demonstrated since the primary source of the State's economy is concentrated in trade and service provision, including export of goods.

Tourism is a significant attraction to the city. It is one of the ten most popular cities to visit by Brazilian tourists due to the large stretches of beach. In 2016, according to the Ministry of Tourism, Fortaleza was the most sought-after destination in the country, both for leisure and for business event tourism.

Figure 1. Fortaleza location



Source: Collage made by the author.

Regarding industrial production, according to the Final Report on Mapping the Use and Land Cover of SEMACE (Secretariat of the Environment of the State of Ceará), the complex is promoted by the activities of transformation (89.96%), civil construction (9,54%), public utility (0.44%) and mineral extraction (0.07%). (Secretaria do Meio Ambiente do Estado do Ceará (SEMACE), 2016)

In agriculture, the Municipality has as its primary products cattle breeding, goats, horses, sheep, and pigs, where agriculture is insignificant due to the city's urban density.

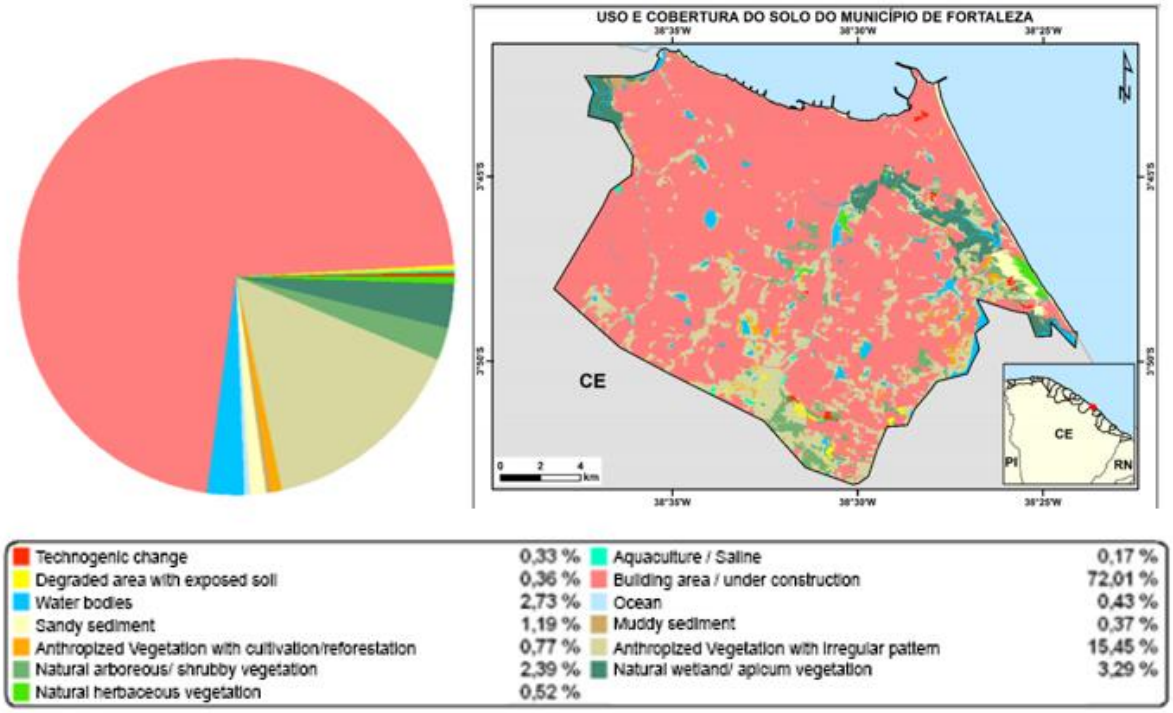
According to the report, the following percentages of land use occupation were found:

- Built / under construction area (72.01%) - Municipality of the State of Ceará, which has the highest occupation in its territory;
- Anthropized vegetation with an irregular pattern (15.45%) - more significant occurrence in the eastern portion of the Municipality;
- Natural mangrove / apicum vegetation (3.29%) - highest occurrence in the fluviomarine plains of the Cocó and Ceará rivers.

The Anthropized vegetation with an irregular pattern is mainly shown in relatively large plots compared with the urban tissue of the city, which are empty (public or private ownership) and remains of uneven plot division from irregular habitation close to the smaller natural water resource.

Due to the intense occupation and urban expansion that it has suffered throughout its history, Fortaleza would have only 0.52% natural herbaceous vegetation and 2.39% natural tree/shrub vegetation. In addition, the class of anthropized vegetation of culture/reforestation is insignificant in the Municipality, only 0.77% according to IBGE - Brazilian Institute of Geography and Statistics (2014).

Figure 2. Land Use and Coverage in the Municipality of Fortaleza



Source: Secretaria do Meio Ambiente do Estado do Ceará (SEMACE), 2016.

The occupation of wind farms and mining activities by the Port of Mucuripe corresponds to 0.33% of coverage throughout the Municipality. The water bodies represent 2.73% of the Municipality, basically composed of the Cocó River, Pacotí River (the largest river between Fortaleza and its neighboring municipalities), Ceará River, and the Parangaba Messejana, Iracema, Opaia, Maraponga, Porangabussu lagoons, and Sapiranga, among other smaller streams. Also, in the Municipality are located parts of conservation units such as the Rio Cocó State Park, which was analyzed in this article, presenting different land use and cover types.

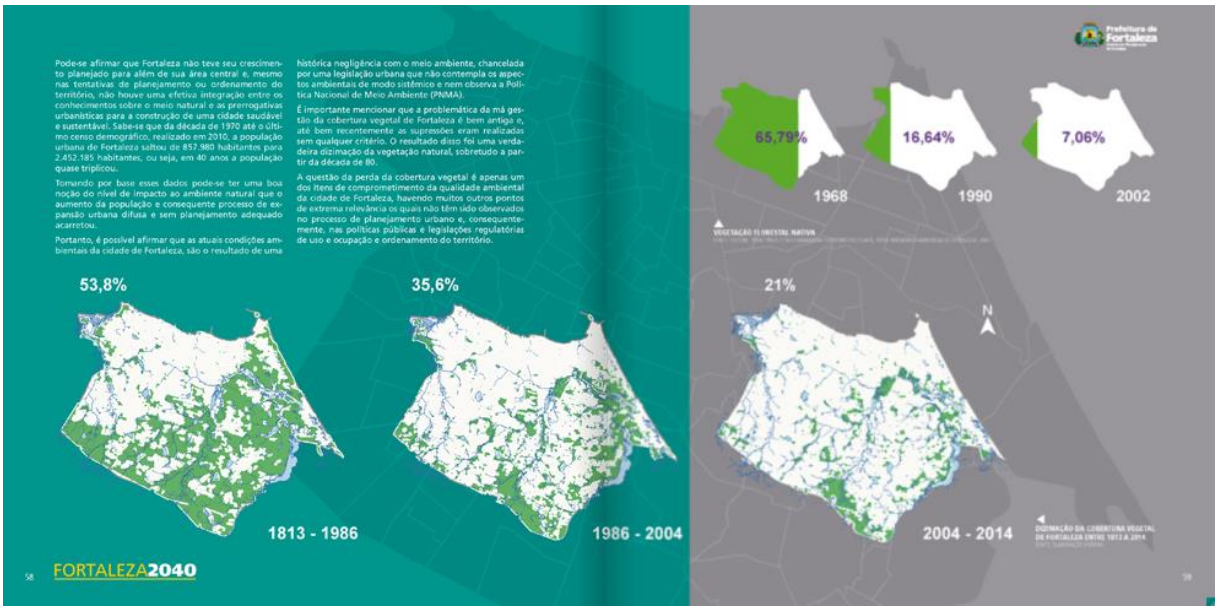
4. Urban analysis

4.1. General urban scale analysis on urban green infrastructure in Fortaleza

The city of Fortaleza is relatively new. At 294 years old, it was possible, as previously seen, that its urban occupation was practically unanimous, with almost no rural activities. In addition, its distribution of green areas has a history intertwined with the first occupational activities, for example, the village that gave rise to the city of today used to follow the Pajeú stream, nowadays it is almost wholly buffered, hidden, like a sewer, where today we located the center.

Due to this reason, it can be understood that over the years past governments have been more concerned with the development of surface areas for the use of public and private transport and for buildings, most of the large green areas are remnants that somehow could not be occupied and that today several floods are identified concerning the buffering of water tributaries in the city. Therefore, the central drainage system of the city is made through concrete urban infrastructure, with openings of drainage galleries for the drainage of water from impermeable areas.

Figure 3. Fortaleza 2040 informative booklet – Green Coverage evolution



Source: Fortaleza 2040 booklet. Municipality of Fortaleza.

(https://fortaleza2040.fortaleza.ce.gov.br/site/assets/revistas/i-mostra-virtual/index.html#page/58)

"In Fortaleza, as in most large cities in Brazil, there was growth without the proper planning and coverage of infrastructure. The consequences of this practically spontaneous expansion are felt today, impairing the functioning of cities in several aspects, from sanitation, housing, road network, urban drainage, among others. In view of this, urbanization and disorderly occupation did not consider the relief that determines the natural drainage system, and constructions and landfills were then carried out in inadequate locations, such as in preferential low drainage lines (depressions) (Prefeitura de Fortaleza, 2015).

Despite this, areas such as the beach strip, riverbed areas, and the northeast and east areas of the city show the most significant portion of the remaining natural area with the most biological active surface and the most vulnerability. This is justified since the east area is a newer development channel for the city, the natural green areas are protected by law, the Brazilian Forest Code, and the beach strip, moreover to be legally protected, has variants that diminish the advantage for the construction of buildings for housing/commerce.

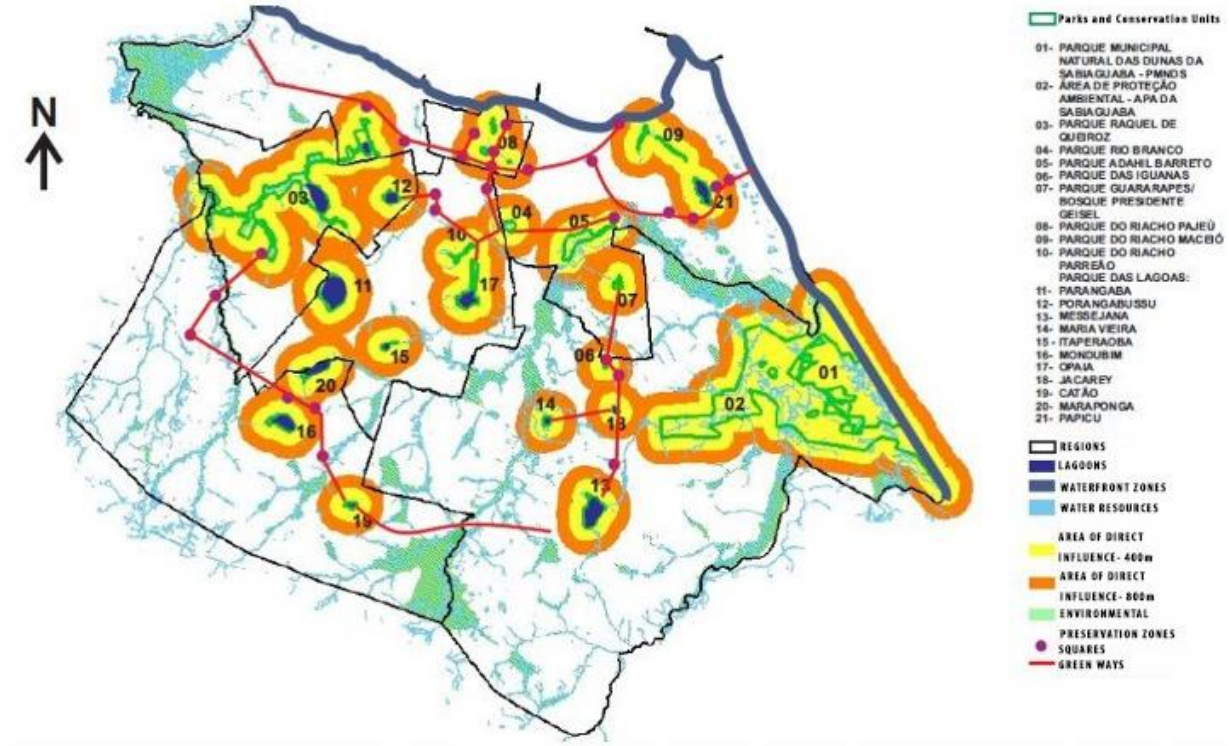
"New Brazilian Forest Code (Law 12.651 - 2012) provides for the preservation of native vegetation and repeals the Brazilian Forest Code of 1965, determining the responsibility of the owner of protected environments between the Permanent Preservation Area (APP) and the Legal Reserve (RL) to preserve and protect all ecosystems. The New Forest Code raises controversial points among ruralist and environmentalist interests to this day."

"The Environmental Protection Area (Law 6.902 - 1981) establishes guidelines for the creation of Ecological Stations and Environmental Protection Areas (APA's). Ecological Stations are representative areas of different ecosystems in Brazil that need to have 90% of the territory unchanged, and only 10% can change for academic purposes. APA's, on the other hand, comprise private properties that can be regulated by the competent public agency in relation to economic activities to protect the environment."

The city is in the process of carrying out projects related to the FORTALEZA 2040 program, which is planning for the city with strategies to be implemented in the short, medium, and long terms, aiming at urban development that is based on sustainability.

The city does not have a green network, which can be identified are interventions made in a separate way. With the Fortaleza 2040 project, an introduction was made with presentations of what would be Urban Green Infrastructure and how important it is for the city's sustainable development.

Figure 4. Natural Systems Network



Source: Natural Environmental Policy. Municipality of Fortaleza`s digital collection.

Through the program, macro-scale analyzes were carried out, and the system and structure of green spaces present in the urban network of Fortaleza were identified and demarcated. Among the projects, we can mention some being implemented/implemented, such as the Raquel de Queiroz and the Maceió Stream public parks of the city's Afforestation program. Even identifying areas suitable for a network of green infrastructure, projects are carried out in an independent way in which their promotion seems to be more important than their execution.

It is noticeable that the public parks under implementation or implemented play an essential role concerning the rapprochement of society with the rivers/streams in question, there is a big difference between exposing an affluent and hiding it as was done previously with the Pajeú Stream, in addition to that the quality of rainwater runoff also changes.

Although further interventions would be needed along the streams, due to all irregular situations such as sewage, housing, irregular garbage deposits that unfortunately overload the water system, in addition, the interventions that were made were little explored in relation to biological diversity, perhaps related to implantation aimed only at mainly improving the visual quality or the sense of security.

Figure 5. Maceió Stream and Raquel de Queiroz public parks

Source: Fortaleza 2040 Report. Municipality of Fortaleza.

Regarding the planting of trees in the Municipality, a project of urban green structure, in 2014, also part of the Fortaleza 2040 project, the city's Arborization Plan, with a participatory nature of civil society and private initiative companies and City Hall bodies. It has the function of planning, execution, and maintenance of distributed green areas, with private companies participating with donations, plantations, and maintenance of trees. These are the results so far provided by Fortaleza City Hall:

Table 1. Results of planted trees by Fortaleza City Hall

Planted	2013	2014	2015	2016	2017	2018	2019	2020[2]	Total
Planted and donated trees	2970	8865	26187	38594	44119	36535	28370	3051	187884

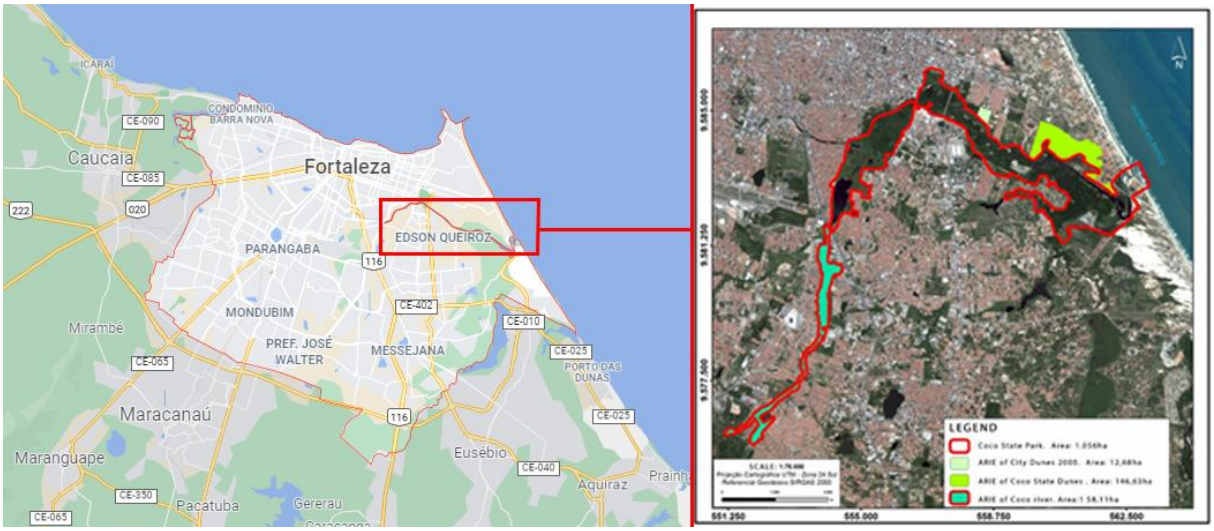
The actions take part in amplifying the arboreal coverage area in the sidewalks of the city through the incentive and population interest in having a tree and being responsible for it together with the town hall and donation of tree seedlings to the citizens through different ways in addition to educational actions.

Despite the city having its urban infrastructure problems and mainly related to natural green areas and its management, Fortaleza is in the process of developing strategies and actions that aim at an evolution of the quality of life, in which nature is an essential element for the health of citizens and the city in which it means requalification, renovation, and future.

4.2. Analysis of the Cocó Park and the green system in the urban context

Cocó Park is a public park that has a linear greenspace structure, is located on the lower course of the Cocó River. It has 1155 ha, in which the hydrographic basin is completely inserted in the Metropolitan Region of the City of Fortaleza, draining about two-thirds of the area of the Municipality. It is an area identified as an estuarine complex in which the ecosystem found is represented by mangroves which are of great importance for regulating environments in the tropical coastal region. This biological active surface comprehends around 542 km and embraces 13 neighborhoods.

Figure 6. Proposed Natural conservation unit For the Cocó Park



Source: Secretaria do Meio Ambiente do Estado do Ceará (SEMACE), 2016.

Because it is the largest urban park in the city and because the mangrove is an ecosystem that is difficult to access physically, its use for leisure is restricted to only a few portions. It is possible to find trail areas and ample spaces for the community, and even boat trips on the river.

The Cocó River represented a physical barrier to developing the urban fabric until the middle of the 20th century. The expansion only occurred from 1954 when it was possible to divide the land in the eastern region due to the authorization of the City Hall. Historically, it was a region widely explored for its saline activity, being the main degradation activity of the mangrove. With the decline of the salt flats, the mangroves regenerated again in the 1980s.

Figure 7. Saline activity

Source: Do Carmo, 2020.

Law No. 12,651 of May 25, 2012, in its Art. 40, item VII, in addition, is an Environmental Preservation Zone (ZPA) of the Participative Master Plan from Fortaleza.

The ecosystem of the preservation area has been excessively pressured by the resident population in its surroundings due to irregular housing and real estate speculation, being

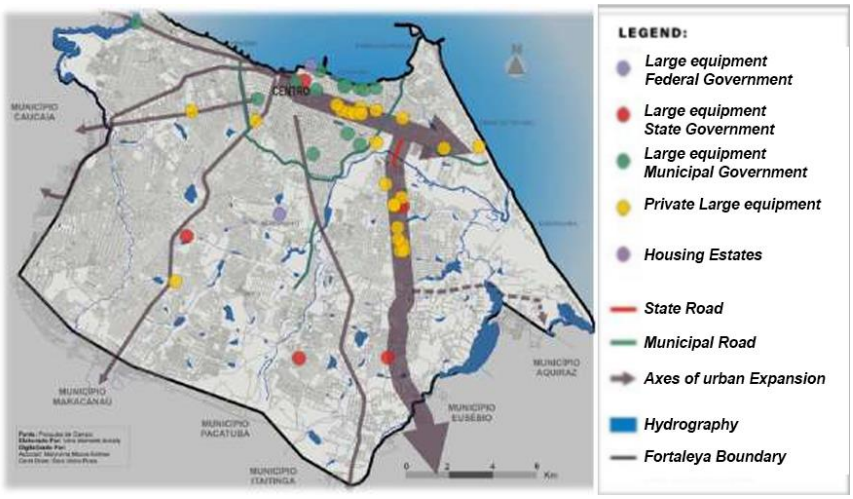
possible to identify extensive areas of floodplain altered by the construction of condominiums, commercial buildings, subdivisions, leisure areas, among other attacks the quality of the water system such as disposal of domestic and industrial waste and sewage and landfills.

The commented actions caused a great process of silting, modifying the behavior of the movement of the waters during the rising and falling tides, consequently compromising the maintenance of the life of the mangroves. However, according to the Secretariat of the Environment of the Government of the State of Ceará, it is an environmental resource of significant importance for the maintenance of the population's quality of life. In 1968, the capital had 65.79% of its space occupied by green areas. In 1990, 16.64%. In 2002, only 7.06%.

4.3. Analysis of the Cocó Park as the main structure of an urban green infrastructure network in Fortaleza

The east side today is the newest axis of economic and urban development of the city as it is an area that is getting denser, and this is a factor for the strategic and sustainable urban project plus the concern for the protection of the green spaces that still exist related to this extensive green system of the Cocó and the Natural Sabiaguaba Parks.

Figure 8. Map of urban expansion in Fortaleza



Source: Accioly (2008).

On a macro scale, the direct connection to the Sabiaguaba Natural park (demarked in light blue) can be seen, being they dependent on each other, since it is the last stretch that the river flows into the sea, besides the dimension that the Park extends through the city compared to the marked green areas on the map below.

The Park is essential for the quality of life in the city, and its linearity is of great importance due to its scope related to drainage as well. In addition, it is noticeable that it was also the target of the afforestation project in a few points demarked with the yellow also on the map below.

Cocó Park has four main crossing sections demarked in pink lines, which are very important due to its great extension in the city, of which two are highways in bridges that connect the city in the Brazilian transport network. As they are areas of rapid transition, only road separations are identified through central beds, with no areas for pedestrians or cyclists to cross.

Figure 9. Crossing sections in Cocó Park

Source: Collage made by the author.

Despite being an urban park and natural preservation area, many parts of the Park are difficult to access due to the mangrove. Because of this, some small areas, compared to the size of the Park in total, were structured for people to use, with trails, viewpoints, amphitheater areas for yoga and sports such as tree climbing, football and volleyball, kids' playgrounds, and even a Secretary of the Environment post.

However, areas that do not have this use become dangerous due to the poor quality of public safety and precarious lighting. Railings border the Park, and access is limited at night due to lighting and security problems and irregular housing, although this solution is not of the best quality.

In addition, many biological research studies are done through the Park, as there are areas that people still cannot usually reach, animals and plant species are found that are not common in the city due to the park size, but that more and more are being threatened by pollution and by irregular housing.

5. Conclusion

With the previous analysis, it was possible to produce a SWOT table, identifying the strengths, weaknesses, opportunities, and possible threats.

Table 2. SWOT Analysis

Strengths	Weaknesses
The Park has an environmental protection area governed by federal, State, and municipal law.	Because it is a vast park, there is no quality control over irregular housing
It has comprehensive coverage in the city, with an area for biological diversity, and regulation of the microclimate	
It has a connection with the Sabiaguaba Natural Park, increasing its importance in relation to its biologically active surface and creating a system of public urban parks.	There is no maintenance throughout the Park, so it is possible to see garbage disposed in the river and irregular sewage connections
There are multiple different recreational spaces for public use	
The Park has a great advantage for draining rainwater from the city	Lack of public security and lighting

Opportunities	Threats
It is located in an area of economic growth, enabling more significant investment in maintenance and new projects that can increase the city's green urban network.	The exploitation of the real estate market puts the Park at risk since even being protected, entrepreneurs pass the laws and build large residential or commercial condominiums.
With the Fortaleza 2040 plan, greater visibility to the Park and environmental education incentives may be possible.	Risk of natural areas in the Park with irregular housing and pollution

Despite the areas of environmental protection and that the city of Fortaleza has realized the need to implement more green areas/plant more trees in the city and the importance of this natural system, there is still much pressure from the real estate market due to the great value of the lands close to the parks, this also influences political decisions, and this system is increasingly being threatened.

It is possible that projects that bring the population closer to the environmental understanding would be of great importance, in addition to the creation of new areas for economic development, reducing the saturation of the city's eastern area, accompanied by the development of quality green areas.

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The Impact of Stock Prices on Prices of Selected Agricultural Commodities

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Abstract
The level and dynamics of selected agricultural commodities price, cotton; lumber and wheat; have important social and political consequences. They have an impact on producers' incomes and consumers purchasing power. The study entailed price development of these agricultural commodities, the cause-and-effect relationship, and long run relationship between stock prices agricultural commodities prices. This study aims to analyse the price development of agricultural commodities and relationship between financial markets and price commodities. Results shows that these agricultural commodities change in price was influenced in case of cotton and wheat by weather the most and in case of lumber by overall demand on housing market. Long run cause and effect was spotted in case of indexes on lumber and in case of cotton on Euro Stoxx 50, MOEX, MSCI emerging, MSCI world and SP 500. A long-run relationship indeed exists in between prices of MSCI emerging markets and lumber prices and between cotton and Euro Stoxx 50, MSCI world and SP 500. The recommendation and suggestion for investors are also described within this study.

Keywords: *agricultural commodities, indexes, financial market, dynamic correlation, cause and effect, volatility*

JEL Classification: *C32, G15, Q02, Q14*

1. Introduction

Commodities play the main key role in global trade connecting all the nations around the world by export and import (Benoit & Douillet, 2014). The trade of commodities is however influenced and affected by numerous factors, which have been analysed and studied from various perspectives (Kirikkaleli & Güngör, 2021). When the prices of commodities fluctuate, or they are changing unpredictably, it can be challenging for sustainable trade flow (Imf, 2012). With the increasing globalization and changes in global conditions, commodities became also one of the best investment alternatives after stock classes (Deminova-Menzel & Heidorn, 2007).

There is growing evidence that commodity prices and stock prices move together and that the link between them has strengthened (Mustafa & Erhan, 2016). The connection between these two markets was also acknowledged by (Nicolau, 2010) who implies that based on economic theory, commodity prices have a positive relationship with interest rates and interest rates have a negative relationship with bonds or shares. Also introduced the linkage of financial derivates and commodities as reported by (Chorafas, 2005) to him the important player which is connecting these two derivates is inflation according to which there is negative relationship between inflation and financial derivatives. From the point of view of investments, (Rehman & Vo, 2021) see commodities as a popular asset for novice investors as well as for experienced traders, regulators, and academics. Study conducted by (Domanski & Health, 2007) provides evidence, that presence of investors increased in years 1998-2006, which they found based on increasing number of commodity derivatives contract. (Sardana, 2019) was looking into the correlation between commodities and S&P 500 index. It was showing 13 commodities and how they are correlated with this index. (Tarek & Derbali, 2016) found empirical evidence that correlation between commodity and Islamic stock markets are time-varying and highly volatile.

Similar results were found also by (Khan & Masih, 2014) who emphasised the role of financial crisis in 2008 and its impact on this relationship. (Murphy, 2015) compared stock and commodities by CRB index which shows commodity prices and S&P 500 between 2006 and 2012. He found out that these two markets started to be linked together more after the financial crisis in 2008. From the research of (Nirmala, 2018), where he examines relationship between commodity and equity markets from 2013 and 2018 by usage of VAR cointegration we could see that he found out that in long run there is no correlation between these two markets. (Black J & al., 2014) investigated the connection between stock price and commodity price by cointegration test of S&P500 price and S&PGSCI price. They found out that there is long run cointegration between them

1.1. Commodities and Commodity markets

According to (James, 2016) the commodity market represents a tangible or intangible place, where are meeting buyers and sellers of commodities for a purpose of trade and they are the essence of each manufactured good. Because they represent the heart of each produced good, they have a significant role in the world`s economy, which makes these assets very attractive for investment purposes.

1.1.1. Lumber

From the point of view of global economy, as it was stated by (FAO, 2017), lumber contributes with the 1% of the total global GDP and the biggest producers are US, Russia, China, Canada and Brazil. Price of the lumber is mostly driven by supply, availability and price of substitutes, trade policies and construction and housing data.

1.1.2. Cotton

(Stark L, 2020) describing cotton as a type of crop which is used in production of textile fibre and it is highly demanded in the economy. It is preferable crop because it is strong, washable, printable and comfortable which makes this commodity suitable for trading. However, this type of commodity is sensitive on climate changes.

1.1.3. Wheat

Based on (Devi & al., 2021) wheat has second place of most produced grains right after corn. According to him, India is one of the largest countries in terms of wheat production and consumption. One of the reasons why it is popular to grow wheat and include it to everyday diet is that the wheat has ability to adapt and grow on different types of soils and climates. From the point of view of market, it is hard to predict what can happened, because wheat production depends on weather conditions.

2. Data and Methods

Methodology contains empirical estimation of the connection between lumber, cotton, wheat prices and stock prices, for which we used prices of indexes S&P 500, MSCI world, MSCI emerging markets, Euro Stoxx 50, Shanghai Composite and MOEX. To analyse price development of lumber, cotton and wheat, as well as other methods, monthly price data were

collected from January 2011 till October 2020, and the main source of statistical data was one of the best global finance platforms Investing.com.

To examine whether there is a cause-and-effect relationship between the two variables, we use Engle-Granger Causality test, by proving that they share a common long run trend. The hypotheses for Engle-Granger Causality test are as follows:

(H0): There is no long run causal relationship between the two variables. If the (probability) P > 5%, then the null hypothesis (H0) is accepted.

(H1): There is a long run causal relationship between the two variables. If the (probability) P < 5%, then the null hypothesis (H0) is rejected (Al-Ameer & et al., 2018).

To conclude this test, we need to conclude unit root test to verify stationarity and VAR to detect lag length.

Basic formula for Granger Causality test is:

$$Y_t = a_0 + \sum_{i=1}^{n} a_i Y_{t-i} + \sum_{j=1}^{n} \beta_j X_{t-j} + \varepsilon_{1t} \quad (1)$$

$$X_t = x_0 + \sum_{i=1}^{n} x_i X_{t-i} + \sum_{j=1}^{n} \delta_j Y_{t-j} + v_{1t} \quad (2)$$

where:

Yt = vector

Xt = variables

β and α = coefficients

α and x = constant

n = optimal number of lags

ε and v = are vectors of the error terms

To establish a long-run relationship between variables it is necessary to perform a cointegration test. For that purpose, we will use the Johansen Co-integration test. Its methodology takes its starting point in the vector autoregression (VAR) of order p given by formula:

$$y_t = \mu + A_1 y_{t-1} + \cdots + A_p y_{t-p} + \varepsilon_t \quad (3)$$

Where:

yt = is an nx1 vector of variables that are integrated of order one

εt = is an nx1 vector of innovations

For that purpose we set the following hypothesis:

(H0): there is no cointegrating equation

(H1): there is cointegrating equation

If some of our data is stationary and some is stationary at 1st difference, we can't use in those cases Johansen co-integration test but bounds cointegration test to establish a long run relationship. This test was proposed by (Pesaran H & al., 2001)

Generalised formula for Boudns Cointegration test is specified as:

$$Y_t = \gamma_{0j} + \sum_{i=1}^{p} \delta_i Y_{t-i} + \sum_{j=0}^{q} \beta'_j X_{t-j} + \varepsilon_{1t} \quad (4)$$

Where:

Yt = vector

Xt = variables are allowed to be purely I(0) or I(1) or cointegrated

β and δ = coefficients

γ = constant

p and q = optimal lag orders

εt = is a vector of the error terms

The hypothesis is stated as:

(H0): there is no cointegrating equation

(H1): there is cointegrating equation

3. Results and Discussion

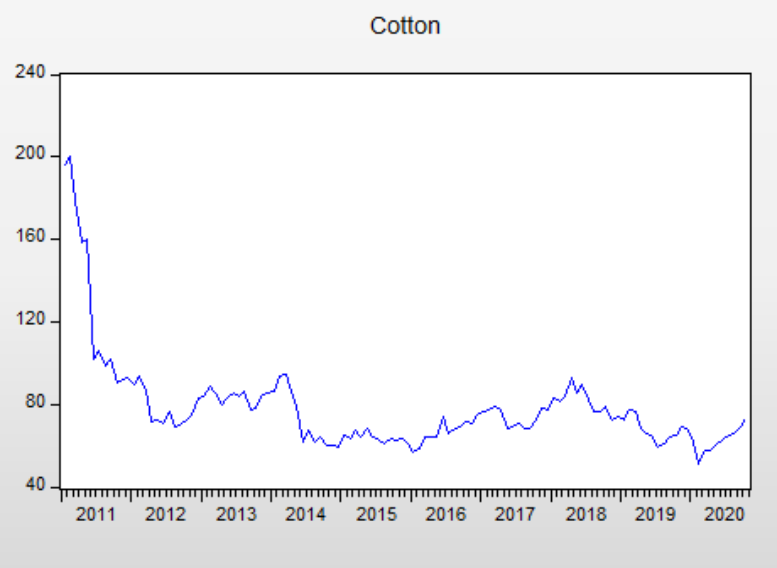
3.1. Commodities and Commodity markets

Each commodity and index price changes differently based on some market occurrences. Several changes in prices have occurred in recent years.

3.1.1. Cotton

Price development of cotton starts with the spike of price in 2011 due to a shortage of fiber. This enormous demand came as a consequence of rebounding from global financial crisis and because India, second world's largest exporter, restricted shipments to help its domestic textiles industry. Such high prices encouraged farmers to plant more cotton. However, such high prices respectively brought lower demand for cotton. As a result, price of cotton fell and stabilized on 75 USD/pound with some fluctuation. 34% drop in price occurred in 2014 due to lower demand from biggest importer China. We can see that from year 2016, cotton prices started to grow again which was caused by trade agreement between China and US, where US provided 45% of China´s total import volume of cotton. However, due to the trade war in the 2018, price fall because US was no longer importing to China and US has surplus of cotton. In between years of 2019 and 2020 price volatility occurs due to Covid-19, however, it rises in the end of 2020 as a result of again higher demand from China.

Figure 1. Cotton price development



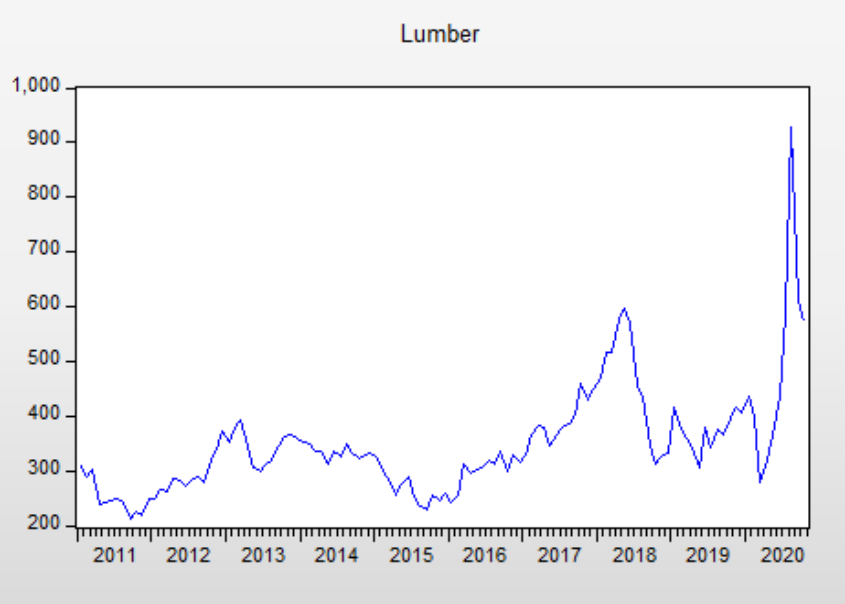
Source: own data processing, EViews 10

3.1.2. Lumber

In case of lumber trading, China has one of the strongest market positions in the world. Their demand for lumber changed the price of lumber in early 2011 and late 2011 as well as it is visible from Figure 18. In early 2011 there was higher demand for lumber from China, because of forest shortage. However, demand from China decreased in the end of 2011 which resulted in decrease in price of lumber. From 2012 prices were slowly increasing due to boom of housing market in the US. Lumber market started to supply more of this commodity which however resulted in higher supply than demand, so the price was slowly decreasing from 2014 till 2015. In 2016 prices of this commodity increased by about 12% over the period from the first quarter till the third quarter. Prices have been relatively flat since then. From the end of 2016 prices

started to grow and they skyrocketed in 2018 to 597.1 USD/1000 board feet. Big downfall of lumber price was caused by low demand and high supply. This low demand happened because of the change of consumer behavior. Housing was no longer tail wind for the economy, there was a high number of house inventory and customers started to prefer small size houses. On the other side, high supply happened as a result of high prices of lumber. After 2018 lumber price was quite stable until Covid-19 crisis. In the beginning of the crisis lumber price skyrocketed and reached 928 USD/1000 board feet. It was driven by demand from consumers for single-family housing. This demand was caused by Covid-19. People were not able to travel so they invested their money in housing. However, after this high price, market was trying to stabilize very soon.

Figure 2. Lumber price development

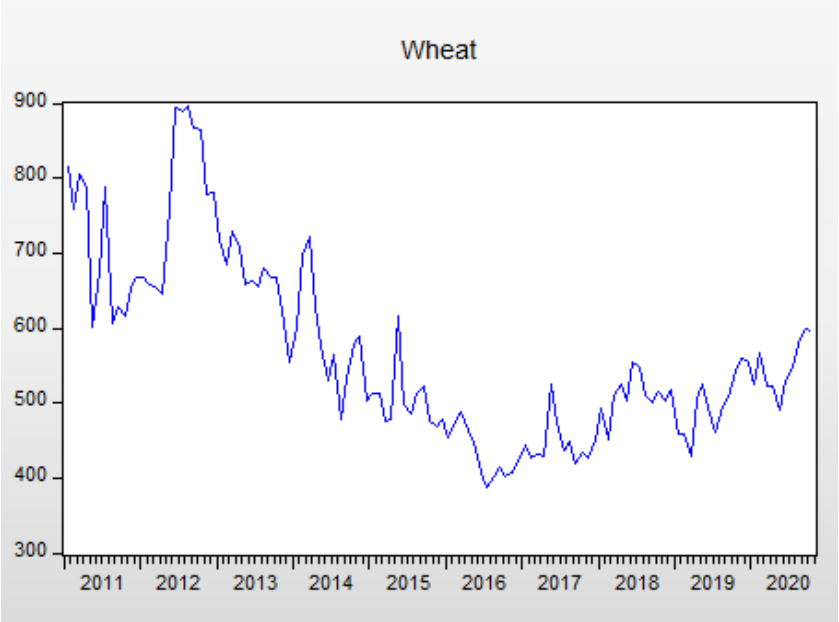


Source: own data processing, EViews 10

3.1.3. Wheat

Wheat price had a positive development from spring 2010 and it reached its maximum on the beginning of 2011 when the price of wheat was 816.38 USD/BU. These high prices were caused by bad weather conditions in US as well as in Europe and Asia. However, in 2011 weather conditions changed and harvest was much higher which caused price of wheat to drop to 615.80 USD/BU. In 2012 price of wheat stroke its highest point of 895.63 USD/BU. It was caused by a big drop in supply of corn so demand for wheat increased. Later market slowly stabilized and in July 2013 the price of wheat was 656.88 USD/BU. However, in the end of the 2013 wheat price dropped even further as a result of lower price of corn. Soon it stabilized and rose again. This rise in 2014 was followed by higher drop in price and from that year till 2016 price of wheat has decreasing trend, mostly because high inventories of wheat are stocked in big growers from Russia to US. This decreasing trend changed in mid-2016, when world wheat consumption exceeded supply and price of wheat started to rise in slow peace with some volatility which was caused by price of substitutes. In 2018 prices for all major cereal commodities increased due to weather conditions which resulted in poor harvest. In 2019 price of wheat stabilized but soon raised again because Russia announced export taxes on wheat and price of corn raised as well.

Figure 3. Wheat price development



Source: own data processing, EViews 10

To undergo the testing procedure for time series data, it is necessary to test stationarity (Keong, 2014). For this purpose, we decided for an Augmented Dickey-Fuller test and Kwiatkowski–Phillips–Schmidt–Shin test. According to both tests all variables are stationary at 1st difference. To choose the optimal lag, we estimated VAR model and within this model we choose Akaike information criterion (AIC), which suggested 6 lags for our model.

3.2. Engle-Granger Causality Test

When we are looking into the long run cause and effect of commodities on indexes, we can conclude that Euro stoxx 50, MSCI emerging, and SP 500 prices lead lumber prices, from which the most significant cause is from SP 500.

Table 1. Engle-Granger Causality test indexes cause on commodities

Commodities		Indexes					
		Eurostoxx 50	**MOEX**	**MSCI emerging**	**MSCI world**	**Shanghai**	**SP 500**
lumber	Prob.	0.0219*	0.2559	0.0956	0.0140*	0.6753	0.0018**
wheat	Prob.	0.6816	0.4652	0.8135	0.7443	0.6297	0.5778
cotton	Prob.	0.6190	0.5652	0.4852	0.7487	0.1353	0.8163

Source: own data processing. EViews 10

Table 2. Engle-Granger Causality test commodities cause on indexes

commodities		Indexes					
		Eurostoxx 50	**MOEX**	**MSCI emerging**	**MSCI world**	**Shanghai**	**SP 500**
cotton	Prob.	0.0467*	0.0018**	0.0005**	0.0002**	0.3788	0.0015**
lumber	Prob.	0.6334	0.7673	0.8053	0.3342	0.9277	0.0627
wheat	Prob.	0.8846	0.0415*	0.3109	0.9196	0.9121	0.8356

Source: own data processing. EViews 10

When we are looking into the long run cause and effect of commodities on indexes, in case of cotton we can accept H0 hypothesis in case of Shanghai index, where cotton prices don't lead Shanghai index prices. However, cotton prices lead MOEX, MSCI emerging. MSCI world and SP 500 prices on 0.1% significance level and on 0.5% significance level Euro stoxx 50 and in case of wheat, we were able to spot cause and effect of wheat prices on MOEX index prices. Overall, by Engle-Granger Causality test, we could spot that some commodity and index prices share a common long run trend and there is a cause-and-effect relationship between them.

3.3. Johansen cointegration test

To check for a long-run relationship between different price series it is necessary to perform the Johansen cointegration test. However, in case of cotton and coffee, their relations to indexes won't be tested by Johansen cointegration test, but by Bounds cointegration test, because the time series were both stationary and stationary at first difference so they cannot be tested by Johannsen cointegration test. Long run relationship exists between MSCI emerging markets and lumber prices. P-value (0.04) is lower than level of significance 0.5, which means that we can accept alternative that there is long run relationship between MSCI emerging price and lumber price. At the same time the P-value at most 1 (0.03) is <5% (0.05), therefore we reject H0 that states that there is no cointegration between the variables which means there is a long run relationship between these variables. In other cases, no long run relation was spotted so we can accept H0 that states that there is no cointegration between variables.

Table 3. Johansen cointegration test

		indexes					
	P-value	**Eurostoxx 50**	**MOEX**	**MSCI emerging**	**MSCI world**	**Shanghai**	**SP 500**
lumber	None	0.6462	0.586	0.0388*	0.1476	0.481	0.1839
	At most 1	0.0788	0.9046	0.3380	0.5478	0.124	0.6803
wheat	None	0.244	0.262	0.1795	0.9245	0.1119	0.9532
	At most 1	0.1991	0.181	0.0714	0.4169	0.1261	0.5222

Source: own data processing. EViews 10

3.4. Bounds Cointegration test

Results shows cointegration between variables of different orders. That is, a combination of both level - and first-difference stationarity. Cotton is stationary; however, indexes are stationary only at first difference. That is the reason why we need to perform bounds cointegration test, because Johansen cointegration test is no longer valid in that case. Results shows long run relationship of cotton prices and indexes prices. From our calculations we can conclude that we could spot cointegration between cotton and Eurostoxx 50 (3.62), MSCI world (4.32) and SP 500 (7.38). Because in each of these cases, F-statistic was above I (1) which means that we can reject H0 and accept alternative that cotton price share long run relationship with MSCI world, SP 500 and Eurostoxx 50.

Table 4. Bounds Cointegration test

		Eurostoxx 50	**MOEX**	**MSCI emerging**	**MSCI world**	**Shanghai**	**SP 500**
cotton	F-statistic	3.618446*	2.074721	2.467805	4.324227*	2.227654	7.380226**
	I(0)	3.02	3.02	3.02	3.02	3.02	3.02

I(1)	3.51	3.51	3.51	3.51	3.51	3.51

Source: own data processing. EViews 10

4. Conclusion

Economic theory explains possible connection of commodity and financial markets. It states that inflation is the main indicator, which connects these two markets. According to this economic theory, commodity prices have positive relationship with interest rates and high inflation and interest rates and high inflation has negative relationship with bonds or shares. There are many studies proving that stock prices and commodity prices interact between each other. There is historical evidence that a change in commodity prices have significant impact on economic and financial development, so we expected that the correlation between these two should be quite strong.

Commodity and index prices which we chose for our research, namely lumber, cotton, wheat, S&P 500, MSCI World, MSCI Emerging Markets, Euro Stoxx 50, Shanghai Composite, and MOEX, change differently based on specific market occurrences. Financial crisis in 2008 impact was visible also in 2011 on all commodities but mainly in commodity gold and indexes Euro stoxx 50, MOEX, MSCI world and MSCI emerging. However, change in price in commodities was influenced in case of cotton and wheat by weather the most. When there were good weather conditions, supply of these commodities was higher than demand and prices were falling. On the other side we expected lumber to have biggest connection with Shanghai composite price, because price of lumber changed rapidly when we spotted higher demand from China.

In following chapter, we were trying to find out if there is between commodities and indexes long run cause and effect. Our calculation shows that there is long run cause and effect of some indexes on lumber. Namely Euro stoxx 50 index, MSCI and SP 500. Other than that, indexes didn't have long run cause on effect on other commodities. However, from the position of commodities, we could spot long run cause and effect of four commodities on indexes. Cotton has long run cause and effect on all indexes on Eurostoxx 50, MOEX, MSCI emerging, MSCI world and SP 500, and wheat on MOEX.

Afterwards, we moved into analysis of long-run relationship between them. However, because our data set consist also of variables which are stationary and also some which are stationary at 1st difference, we conducted two types of cointegration tests. Johansen cointegration tests we used for lumber and wheat. From our results we can conclude that there exists long run relationship between MSCI emerging markets and lumber prices. Bonds cointegration test we used in case of cotton because cotton is stationary however, indexes are stationary only at first difference. According to this test, we can conclude that cotton share long run relationship with Eurostoxx 50, MSCI world and SP 500.

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The Distribution of Voting Power of the European Union Member States in Context of Decision-making Process on the Common Agricultural Policy

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Abstract

The Common Agricultural Policy of the European Union is one of the crucial policies shared within the union. With negotiations about the EU-27 long-term budget for the upcoming period emerged also a need to reform agricultural policy. The need for a reform except internal factors pushed also other factors that arose from the macroeconomic, international, and global environment. Three important elements of the new CAP involve increased environmental and climate action, sustainable agriculture, and farmer support. The Council of Ministers is one of the key institutions where agricultural policy issues are being discussed and negotiated. Each member state disposes of some voting power which can significantly affect the process of the debate and overall outcome. Lisbon Treaty modified the voting system within the Council and replaced the qualified majority rules stated in the Treaty of Nice with double majority rule. Moreover, countries share different positions related to the common agriculture. They can establish blocks and veto the decisions, or they can create coalitions with similar interests to accomplish their visions and goals. The main aim of this paper is to examine the voting power of the European Union member states in the context of the decision-making process on the CAP. For the estimation of the voting power, we used power indices more specifically the Banzhaf index. Our findings acknowledge the theory that the largest countries are the strongest players and dispose of with the greatest voting power. Similarly, our findings show that the largest countries also gained the most voting power after Brexit. On the other hand, the voting power of small countries declined. As a result, the powerful got even more powerful, while the weak became even more defenceless. This has a large impact on the future decision making and reforms on the CAP.

Keywords: *Banzhaf Power Index, CAP, Decision-making, Reform*

JEL Classification: *C79, P16, Q18*

1. Introduction

A Common Agricultural Policy (CAP) is one of the oldest and most important European Union (EU) policies. The past few years have been crucial for the future of CAP as a new reform has been discussed and prepared. Previous CAP reforms have been widely researched and analysed. Except for the reform that has been currently adopted, the CAP took place through the six reforms, which changed the number of policy instruments and/or amended existing policies (Garcia-Duran, Casanova and Eliasson, 2018). The resulting reforms have over time gradually recalibrated CAP goals to help them address emerging socio-economic needs and developments within both the EU and global domain (Henke and Sardone, 2017). Initially, support from the CAP focused mainly on maintaining a minimum price of agricultural products of member states (Ackrill, Kay and Morgan, 2008). The quantity of agricultural products was entirely coupled but distributed with no selection mechanism linked to the conduct of the beneficiaries (Greer and Hind, 2012). The CAP has, nonetheless, consistently failed to meet the challenges raised by the changing conditions and has led to pressures for further reforms (Harvey, 2015). As a

result, the CAP's policy instruments and aims have progressively evolved, from the initial phase of market-price support (1962–1992) to the implementation of production-coupled direct payments (1992–2003) and (predominantly) historical decoupled payments (2003–2013), the period of 'new' societal and environmental CAP priorities (2014–2020) (Garzon 2006; Daugbjerg and Swinbank 2015). Thus, these reforms progressively renewed and reshaped the CAP to more comprehensive objectives and instruments. With negotiations about the Multinational Financial Framework (MFF) for the upcoming period and several other factors, the need for reforming the CAP emerged. Hence, in 2017 the European Commission published a communication "The Future of food and farming" which was in 2018 laid down in legislative proposal. On 20 October 2020, Ministers agreed on a general strategy after a two-day negotiating session to the CAP reform plan post-2020. Besides, the provisional start date of the proposed CAP reform has been pushed back to 1 January 2023. The transitional period has been negotiated for the years 2021 and 2022, after the allocation of the CAP funding from the EU's long-term budget for 2021-2027 (European Commission, 2021). The overall stated principles are to make the CAP smarter, more modern, and more sustainable. According to the European Commission (2018), the future CAP is focused namely on the nine key objectives, including the support of viable farm income and resilience across EU territory to enhance food security; the enhancement of market orientation and increase competitiveness including a greater focus on research, technology, and digitalisation; improvement of farmers' position in the value chain; contribution to climate change mitigation and adaptation, as well as sustainable energy; fostering sustainable development and efficient management of natural resources such as water, soil, and air; contribution to the protection of biodiversity, enhancement of ecosystem services and preservation of habitats and landscapes; attraction of young farmers and facilitation of business development in the rural area; promotion of employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry; improvement of the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, as well as animal welfare. At the same time, the new CAP also focuses on simplifying its operation and improving its performance following the EU targets. The implementation of strategic plans, greater environmental emphasis, changes in direct payments, risk management and definition of 'genuine farmer' are key aspects of the initiatives (Dries, Heijman, Jongeneel, Purnhagen and Wesseler, 2019). Therefore, the new CAP focuses on three major themes including ambition on environmental and climate action, innovation for smart sustainable agriculture and support of farmers.

Over the years the policies that are focused on agriculture within the EU changed their scope, aims and development, however, there were also changes related to the structural modifications in decision-making in general. These modifications affected the institutional set-up within the EU, the voting system and the roles and powers distributed within the individual EU institutions. For instance, Pokrivčák, Crombez and Swinnen (2008) and Lovec and Erjavec (2015) clarified that the improvements in the decision-making procedures and the alteration of the Commission's appointment procedures are two structural changes that are especially significant in enhancing opportunities for reform. Firstly, by replacing the CAP unanimity rule with a qualified majority, established under the 1987 Single European Act, individual member states prevented political changes from being blocked. The Commission has been then able to propose more substantive reforms with exclusive powers to propose legislation. Secondly, the Maastricht Treaty of 1992 introduced the "co-decision" procedure and was extended by Amsterdam (1997), Nice (2001), and Lisbon (2007) Treaties. Treaty of Nice[2] in 2000 modified

[2] According to the Treaty of Nice, the decision could be made if the majority of the countries (more than 50%) with the majority of the voting weights, representing 74% and with most of the population, 62% vote in favor of the proposal. Before 1 July 2013, when Croatia joined the EU, this meant that at least 14 countries with at least 255 of total 345 voting weights with at least 311 million people that vote in favor can pass the proposal. Croatia

the Commission's procedures for selection with a qualified majority (Greer and Hind, 2012). The Treaty of Lisbon from 2007 incorporated even more structural changes to the decision-making mechanism within the EU institutions also affecting agriculture in the EU. Lisbon Treaty[3] replaced the use of voting weights in the Treaty of Nice, which was based on the size of the population of the country. Moreover, before the Lisbon Treaty, the legislative procedure was a "consultation", however, co-decision applies to CAP since the ratification of the treaty (Crombez and Swinnen, 2011). Furthermore, Lisbon Treaty was primarily motivated by an attempt to improve the EU decision-making mechanism for member countries. Indeed, Treaty has strengthened the Parliament's capacity to act and to deliver. It has expanded the full legislative power of the Parliament to over 40 new areas, including agriculture. Since then, Parliament has had the right of a veto on the appointed Commissions proposal and together with Council to amend the proposal (McMahon, 2019). In other words, under the co-decision procedure Commission's proposal must be supported by European Parliament and by the Council to be adopted.

Researchers and practitioners have been concerned for years with the making of decisions in the EU and the political economy of CAP. More theoretical work on the institutional framework for EU decision-making is included in the public-choice theory. One type of study is related to the use of power indices (Kandogan, 2000; Felsenthal and Machover 2001; Aksoy, 2010; Zaporozhets, García-Valinas and Kurz, 2016). The most widely used are Banzhaf and Shapley-Shubik indices, which measure the probability that a member casts a decisive vote. This paper aims to examine the voting power of the EU member states using the Banzhaf index in respect to the decision-making procedure about the CAP.

1.1. Decision-making on the Common Agricultural Policy

Making agricultural policy in the EU is a complicated process affected by a wide range of actors and circumstances. Agricultural decision-making under the Treaty of Lisbon is subject to co-decision and not consultation. Articles 38-47 of the Treaty of Rome set the requirement for the CAP and underlying goals. Although, these aims were restated in Articles 38-44 of the Lisbon Treaty, concerning the Parliament. Article 43 of the Consolidated Version of the Treaty on the Functioning of the EU (TFEU) confirms agricultural policy as an area of 'shared competence' and splits responsibilities for it between the Council, the European Parliament, and the Commission, with the role of the latter to submit proposals 'for working out and implementing the CAP (Tangermann and Cramon-Taubadel, 2013). In other words, Parliament must also adopt a proposal following this procedure before it can become EU law. Therefore, decisions in agriculture are then taken as a 'trialogue' involving the Commission, the Council, and the Parliament and regulatory powers are equally split between the Parliament and the Council.

The legislative process within the EU starts with a proposal from the Commission. This applies also to a policymaking process about European agriculture. However, the need for a new or reformed program must be identified before the Commission presents a proposal. Several factors can build a policy reform agenda and therefore encourage the Commission to draw up and submit a draft. As already mentioned the EU functions at a pace known as MFF.

joined at least 260 votes out of a total of 352 weights of 15 member states with at least 313.6 million population were required for the legislation to be adopted by a qualified majority.

[3] The voting rules defined in the Lisbon Treaty and are effective since 1 November 2014. The conditions for the qualified majority (double-majority rule) are stated in Article 15 of the Treaty on European Union, meaning that decision can be made when 55% of the member states (comprising at least 15 of them) which together represent at least 65% of the EU population vote in the favor of the proposal. This applies if the proposal has been made by the Commission. On the other hand, countries can also block the decision and in this case, at least four countries are required with a population representing at least 35% of the total EU population.

The financial framework defines the EU budget over seven years and, with the expiry of one framework, eventually leads to a discussion of the CAP's position in particular policy areas (Sherriff, 2019). Furthermore, there can be also other factors that can affect the need for reform in agriculture. For instance, the previous CAP reform was discussed during the global recession. Since then, there have been major changes to the framework in which this reform was forged (Massot, 2021). In other words, the economic and structural conditions have changed since the latest adopted reform and the policy must be adjusted to meet the needs of the agricultural industry at the present moment. Many authors focused on the drivers of new reform on agricultural policy. Matthews (2020) claimed that one of the key drivers for CAP modernisation has been the demand for simplification as the CAP is still considered to be a very complex policy. Moreover, factors such as the socio-economic consequences of the euro crisis and global recession, uncertainty on the agricultural markets and macroeconomic factors, geopolitical developments (e.g. Brexit, EU-US conventional relationship under Trump administration, terrorism, migration and refugee pressures, or increasing populism and Euroscepticism), protectionism and trade conflicts, global challenges such as climate change and sustainable development (e.g. Paris agreement - COP 21 and UN's Sustainable Development Goals - SDGs), technological development and the digital revolution (Massot and Negre, 2018; Wieliczko, 2019) also pushed the need for reform. In brief, several factors led to a need for the reconstruction of the agricultural policy of the EU.
There is a large number of players, at different levels and at different times, involved in preparing the policy about agriculture in the EU. According to Dries et al. (2019) the decision-making process related to the European agricultural policy is following:

1. *Commission prepares a reform proposal.*

   – The process of developing agricultural policy in the EU officially starts with a legislative proposal. A revision of the CAP's legal documents, like all European legislation, begins in the Commission, more precisely in the Directorate General for Agriculture and Rural Development, (DG AGRI). As it now has the same decision-making authority as the Council in (most) agricultural affairs, the Commission may either take the lead or be asked to draft a policy plan by the Council of Agricultural Ministers, or theoretically by the Parliament. In any situation, civil societies or even civilians may make contributions to the policy-making process through different official means. The most basic is what the Commission refers to as the General Debate, which is a public consultation conducted online. Moreover, several specialist groups (e.g., non-governmental organizations and lobby groups) are frequently consulted with DG AGRI.
   – The Commission will publish two documents during this process. First, it produces a "communication," after an early public consultation, which describes the major agricultural threats to DG AGRI, establishes the primary priorities for the reformed CAP, and details the policy steps it has proposed. While this paper is just communication, it is important in that it mostly addresses the future dialogue and decides the extent to which the change is at best ambitious. The second is the "proposal." This is the legal text which forms the foundations for further talks. Legal amendments are sent to the European Parliament, to the Council of Agriculture Ministers and the national Parliaments.

2. *The legislators process the proposal internally.*

   – The draft law can pass up to three readings and be submitted between the Council and the Parliament before the Council of Ministers agree on a common document, which,

years after the Commission's proposal was written, often includes final conciliation. To prevent such a lengthy bureaucratic ping pong, the reform of the CAP can be limited to one reading.

- Every procedure is carried out independently of the request of the Commission by the European Parliament and by the Council of Agricultural Ministers (CoAM). Both parties have to take a stand on the proposals after internal discussions between competing national or party interests. Firstly, the CAP documents in the Parliament are sent to a legislative committee to prepare the Parliament's position on the proposal. An advisory role is assigned to other related committees. In the last amendment, though, given environmental issues and policy actions in the proposal the Environment Committee (ENVI) assumed shared leadership. The Commission on CAP issues traditionally has been responsible for the Committee on Agriculture and Rural Development, COMAGRI. At the same time, in Council, the proposal of the Commission is first examined by the Special Committee on Agriculture (SCA) consisting of the permanent officials from the agricultural trials at each member state and the Commission representative who explains and justifies the proposal. For further consideration, the SCA might submit a proposal to a technical workgroup. If a proposal in agriculture affects other EU policies (e.g., trade, or the environment), then the so-called Committee of Permanent Representatives (COREPER) will also deal with it; COREPER is comprised of permanent representatives from each of the member states. The SCA and COREPER also prepare proposals for debate in the Council of Ministers. Proposals on which the member states representatives in the SCA/COREPER have reached consensus are forwarded as so-called "A-points" to the Council of Ministers, which can be adopted without discussion. Points on which the agreement is not reached shall be transmitted to the Council of Ministers as B-points for discussion.
- The Commissions' proposals can be adopted in the first reading or the second reading. If the Council agrees with the Parliaments' position, the reform ends there. In matters where the Council disagrees it draws up its position that may be accepted, amended, or rejected in the Parliament by an absolute majority. However, the Council will follow a general strategy and negotiation mandates in each CAP file, avoiding opening a second reading, and both legislators will aim to reach a consensus.

3. *The legislators negotiate to agree on the common reform text.*

- If proponents of civil society find it impossible to be noticed or influence in the previous process, they are communicating in this case with a brick wall. Negotiations are being held in trialogues between the European Parliament and the CoAM together with Commission as an intermediary in which chosen delegates from individual institutions are present. After all the conflicts in trialogues have been smooth, a diplomatic consensus is reached. Via a plenary debate and ratification by a Council of Ministers, the resultant legislation, known as the Basic Regulations, has, therefore, to be formalized.

4. *The Commission prepares the implementation.*

- DG AGRI shall plan and enact delegated acts to explain technical execution and interpretation information to finalize reform. The employees of DG AGRI can either work in full autonomy to prepare the actions or consult groups of experts. Representatives from all member states, the European Parliament and often independent

experts include the advisory committees dealing with delegated legislation. They may advise the Commission, but none of its proposals is binding. Delegated acts form a major part of the mechanism of implementation since they provide exact guidelines on the implementation of the CAP by the member states. In addition, the Commission adopts implementing acts that lay down procedural rules for member states' application.

2. Data and Methods

The main aim of this paper is to estimate the voting power of the EU member states concerning the decision-making process related to the CAP. In the EU decision-making phase, amongst other things, the frequency at which a member is present in this situation depends on how powerful it is. Furthermore, weighted games are statistical models that examine the allocation of a nation's decision-making power within a supranational organisation, such as the EU Council of Ministers. This decisive character is determined by the number of times a nation votes to a coalition that cannot make a quota in a winning coalition. Each country has involved some votes, and a motion is adopted in these institutions where a coalition of nations has sufficient votes to meet a certain quota (Algaba, Bolbao and Fernández, 2007). The power indicators are a priority for this power measurement. In this study, we focused on the calculation of the Banzhaf power index.

2.1. Banzhaf Power Index

A particular method to measure the power of players was adopted by Banzhaf. Banzhaf (1965) determined the power of player i by the number of times player i is "critical" without considering orders. A player is called critical if it can turn a winning coalition into a losing one. The index indicates how probable a player is to affect a decision (Banzhaf, 1965; Coleman, 1971; Penrose, 1946). Player $i's$ Banzhaf index is measured in the following way:

$$BFI_i = \sum_{s \subseteq 1 \setminus \{i\}} \frac{1}{2^{n-1}} \big(v(S \cup \{i\}) - v(S)\big) = \frac{\eta_i(v)}{2^{n-1}} \tag{1}$$

where $\eta_i(v)$ is player $i's$ Banzhaf score, the number of coalitions where i is critical. Its normalized value is usually stated as the voting power measure. The Banzhaf index is the normalized Banzhaf-score:

$$\beta_i = \frac{\eta_i(v)}{\sum_{j \in N} \eta_j\,(v)} \tag{2}$$

The index indicates a relative proportion of the overall payoff expected by the elector.

For the calculation of the Banzhaf index, we used special mathematical computing algorithms which were invented for this specific purpose. We analysed how the voting power of EU member states changed with adjustments in voting structure, systems, and rules as well as with each enlargement and contraction (Brexit) of the EU.

3. Results and Discussion

The voting power of countries has an impact on the overall decision to be made. Countries can make coalitions and block the decision if they do not agree with the proposal. Therefore, also within the context and positions of member states on new CAP power played a significant role. Table 1 shows the Banzhaf (BFI) index calculated for various regimes since the Treaty of Rome.

The greater power within the EU institutions is held by the large countries, with the most weights (in terms of voting rules before the Lisbon Treaty) and with a higher population share. These countries include France, Germany, Italy, and the UK (before Brexit). For instance, in the case of EU-28, the power of Germany was 10.20%, following were France 8.40%, the UK 8.30%, and Italy 7.80%. In contrast, small countries due to their size have a lower share in voting which are indicating lower values of BFI. For the demonstration, when the Union had 28 members the voting power of Luxembourg and Malta was 1.80%, and at the same time, the share of power of Estonia and Cyprus in voting was 1.90%. Therefore, large countries with the most weights are stronger compared to small countries with fewer voting weights.

Clearly, with each community enlargement, the power of the incumbent member states was reduced as can be seen in the declining trend in the Banzhaf index. For the demonstration, when the community had only six members, France, Germany, and Italy had most of the power during the existence of the EU and its predecessor institutions. The power of these three countries within the community was 23.81% (EU-9, after UK enlargement 16.72%). But when the EU over the years increased to 28 members their voting power measured by BFI decreased to 8.40% (France), 10.20% (Germany), 7.80% (Italy) and 8.30% (UK). Thus, with each enlargement, the power of the most important players decreased. Although, there were almost no changes in the positions of these big players. They held most of the power during the entire period. This can be seen by the same number of votes that were retained during this time by Germany, France, Italy, and the UK. On the other hand, within the EU-6 community, Luxembourg due to its size did not have any power in voting (0.0% in terms of BFI). However, its position and power slightly improved and increased over the years as more countries joined the union.

In terms of mirror images, more than proportionate power rates are presented in the smaller member states are considerably higher than their population share. For instance, in the case of EU-28, the population share of Malta was 0.09% and its voting power was 1.80%, the share of Luxembourg's population was 0.12% while its power was 1.80%, or in Cyprus, population share was 0.17% and at the same time, its power represented 1.90%. Moreover, the power ranges also extend well across medium-sized countries e.g., Belgium, the Netherlands, Denmark, Ireland, Greece, Portugal, Austria, Finland and Sweden, Czechia, Hungary, Slovakia, Bulgaria. On the other hand, the proportion of population related to the power measured by power indices is negative in the case of large counties. For example, with EU-28 the population share of Germany was 16.14% while its power was 10.30% (BFI), which is below its population rate. The same situation was also in France, Italy, UK, Spain, Poland, and Bulgaria, which are the most populated countries of the EU.

The transition from Nice Treaty to Lisbon Treaty rules was also affected by the accession of Croatia in 2013. Therefore, the power of countries decreases with each enlargement and in our case, the results have been also affected by this event, not only by the change of voting rules. Although the differences are still visible, the average power gain for EU large countries by the double majority voting (DMV) method is comparatively higher than for smaller countries. For example, Germany's power indices rose from 7.80% to 10.20% (an increase by 2.4 percentage points), although they are still below population share. Compared with Slovenia, where the power indices increased from 1.30% to 2.00%, representing a difference by 0.70 percentage points.

Brexit is another significant event that affected the EU community. The UK is the first country in history that has left the EU. This leave had also an impact on the distribution of

power between the remaining member states. The UK lost all its power within the institutions of the EU (–8.30% BFI). The winner here is Germany, which power increased from 10.20% to 12.10%. The power of the UK has been also distributed between other countries, with a larger share obtained by more populated and bigger countries. For instance, the power increased in France from 8.40% to 10.00%, in Spain from 6.20% to 7.70%, in Italy from 7.80% to 8.90%. In medium countries, their position and power also rose but not by such portion as in large countries. Thus, there were only minor changes. Moreover, the power of Slovakia (2.30%) and Finland (2.30%) remained the same as measured by BFI. In contrast, small countries lost power with the UK leave measured by BFI, specifically Luxembourg from 1.80% to 1.70%, Estonia from 1.90% to 1.80%, Cyprus from 1.90% to 1.80%, Latvia from 2.00% to 1.90%, Lithuania from 2.10% to 2.00% and Malta from 1.80% to 1.70%. Thus, from this, we can conclude that the large countries became more powerful while the small countries lost a portion of their power due to Brexit.

From the above-mentioned facts, we can briefly summarize the following findings. Firstly, there is a declining trend in power related to new entries into the union. Secondly, the most of power is held by large countries. Thirdly, there is a disproportionate difference between the population share and the share of voting power between small and large countries. Fourthly, the accession of Croatia and the Lisbon Treaty mainly benefited large countries. Finally, due to Brexit, large countries gained more power compared to medium and small countries.

Table 1. Banzhaf index (in %)

	EU-6 QMV	EU-9 QMV	EU-10 QMV	EU-12 QMV	EU-15 QMV	EU-27 QMV	EU-28 DMV	EU-27 DMV
France	23.81	16.72	15.77	12.87	11.16	7.80	8.40	10.00
Germany	23.81	16.72	15.77	12.87	11.16	7.80	10.20	12.10
Italy	23.81	16.72	15.77	12.87	11.16	7.80	7.80	8.90
Belgium	14.29	9.15	8.20	6.66	5.87	3.70	2.90	3.10
Netherlands	14.29	9.15	8.20	6.66	5.87	4.00	3.50	3.70
Luxembourg	0.00	1.58	4.10	1.80	2.26	1.30	1.80	1.70
UK	-	16.72	15.77	12.87	11.16	7.80	8.30	-
Denmark	-	6.63	4.10	4.59	3.59	2.20	2.30	2.40
Ireland	-	6.63	4.10	4.59	3.59	2.20	2.20	2.30
Greece	-	-	8.20	6.66	5.87	3.70	2.80	3.00
Spain	-	-	-	10.89	9.24	7.40	6.20	7.70
Portugal	-	-	-	6.66	5.87	3.70	2.80	2.90
Austria	-	-	-	-	4.79	3.10	2.60	2.70
Finland	-	-	-	-	3.59	2.20	2.30	2.30
Sweden	-	-	-	-	4.79	3.10	2.70	2.90
Czechia	-	-	-	-	-	3.70	2.80	3.00
Estonia	-	-	-	-	-	1.30	1.90	1.80
Cyprus	-	-	-	-	-	1.30	1.90	1.80
Latvia	-	-	-	-	-	1.30	2.00	1.90
Lithuania	-	-	-	-	-	2.20	2.10	2.00
Hungary	-	-	-	-	-	3.70	2.70	2.80

Malta	-	-	-	-	-	0.90	1.80	1.70
Poland	-	-	-	-	-	7.40	5.10	6.40
Slovakia	-	-	-	-	-	2.20	2.30	2.30
Slovenia	-	-	-	-	-	1.30	2.00	1.90
Bulgaria	-	-	-	-	-	3.10	2.50	2.50
Romania	-	-	-	-	-	4.30	3.80	4.00
Croatia	-	-	-	-	-	-	2.20	2.20
Total	100	100	100	100	100	100	100	100

Source: Own elaboration, 2021

4. Conclusion

The main aim is to examine the voting power of the EU member states using the Banzhaf index in respect to the decision-making process related to the CAP as it belongs to the main policies of the EU. The need for the new reform of CAP came with the new MFF for 2021-2027. Moreover, sustainability, climate change and environmental issues have been broadly discussed also in agricultural matters. Thus, the new CAP is to be smarter, more modern, more flexible, and more sustainable, according to the stated ideals. Besides, the positions of member states have a significant impact on the negotiating process as well as on the overall decisions made in the area of shared agriculture. It is generally known that large countries have greater power than small ones when it comes to decision-making. This theory was also approved in our case when measuring the power within the EU Council. The largest countries such as France, Germany, Italy, or the UK (before it left the EU) have been the strongest players. On the other hand, small countries such as Malta, Luxembourg or Cyprus are not in a good position when it comes to voting, as they have less power. There is also a disproportionate difference between the population share and the share of voting power between small and large countries. Moreover, over the years there have been changes in the membership of the EU as new members joined or left the union. For instance, the accession of Croatia and the Lisbon Treaty mainly benefited large countries. On the other hand, Brexit did not affect only the distribution of CAP funds but also the distribution of power. Germany profited the most from the Brexit as its power within the Council increased. Besides, also other large countries such as France, Spain, or Italy moderately improved their position within the voting. In the case of medium countries, it was the only insignificant gain of power. However, the power of small countries decreased with the UK leaving the EU. Therefore, the strong became even stronger and the weak even weaker. This has a significant application related to the future of the EU policies, including agricultural policy matters with a greater focus also on the environment, climate change and sustainability.

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Impact Factors to ICT Adoption and Its Barrier to Adoption in SMEs in Bangladesh

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Abstract

Information and communication technology (ICT) and its effect on performance have become a significant contribution in scientific research in recent years. Previous studies have pointed out the attention to increase and discover the outcome of ICT adoption and implementation in various organizations. Nowadays developing nations have become more concerned about the ICT use and adoption in the new business process in small and medium enterprises (SMEs) like Bangladesh. Subsequently this study intend to investigate the influencing factors for ICT adoption and identify its berries to ICT implementation. Moreover the analysis on the potential direct and indirect stimulus of technological effect in strategic performance of SMEs context in Bangladesh. This research is based on scientific literature analysis of last two decades in scopas index journal. The main findings of the study is that organizational capability, knowledge management and sustainability are directly impacted by ICT adoption in the organization. The findings therefore will provide the important implication to the policymaker and help to contribute to future research in ICT adoption in the SMEs in gaining competitive advantage and strategic performance.

Keywords: *Technology adoption; SMEs sustainability; Information and communication technology (ICT); Bangladesh.*

JEL Classification: *D83, O32, O36*

1. Introduction

Over the past few decades, existing business processes and practices have been changed due to globalization and technological changes. Inauguration of information and communication technology use or adoption in the businesses has made a significant change in economic and social structure in the organization. ICT is one of the important tools of a knowledge-based economy and has become the fundamental pillar of knowledge sharing and knowledge management in organizational learning (Ollo-López & Aramendía-Muneta, 2012). Knowledge sharing is a basic component for knowledge management hence it has created new knowledge and innovation for the positive outcome of economic growth and organizational performance (Ibrahim and Heng, 2015; Lopez-Nicolas & Soto-Acosta, 2010). Due to the rapid growth of the business environment and high competition among the business organizations, ICT has a great impact on economic development in terms of productivity, profitability, and competitiveness (Cakmak & Tas, 2012; Yunis et al, 2018). Moreover, information technology base drivers have a direct contribution in efficiency and competitiveness to gain competitive advantage and a source of idea to the generation of innovation for better organizational performance (Barba-Sanchez et al. 2018). Therefore, all these circumstances drew attention to the importance of affecting factors to ICT adoption towards achieving organizational performance.

The worldwide small and medium-sized enterprises (SMEs) sector have a significant share in the economic development process and important part of the economy for both developed and emerging countries for economic growth, new employment opportunities, and capital

mobility (Tarutė & Gatautis, 2014). They comprise major portion of employment generation in many developing countries. According to the annual report of European SMEs 2014/15, in Europe SMEs represent around 99.8% company whose create 67% of total employment and 58% value-added (Muller et al. 2015), and most of the developed countries has contributed around half of total business and employment contributed by SMEs including Australia and United Kingdom (Tarutė & Gatautis, 2014). While SMEs contributed over 95% in employment and 70% in GDP growth in developing counties (Keskġn et al, 2010), in South Asia SMEs also a significant presence in economic development, in Malaysia SMEs represent 99% of the company (Ibrahim & Heng, 2015). It is therefore important to ICT adoption to provide SMEs business competitiveness in the new knowledge economy. Consequently, there is an inadequate number of studies concerning the factors that impact ICT adoption and its berries to organizational performance.

However, ICT adoption in SMEs in an emerging country like Bangladesh is also challenged and there are some internal and external barriers like lack of investment, ICT infrastructure, insufficient financial support, and lack of knowledge to take advantage of ICT (Hoque et al. 2016). While the global economy is a better change towards development as a result of ICT adoption and the growing reduction in trade barriers, some of the best opportunities for small businesses will arise from their capability to participate in regional and international trade. However, ICT adoption and use in the organization is the source of technological capabilities to innovation, efficiency, and able to make its strategic performance. Moreover, ICT has a significant contribution to knowledge sharing, learning, motivation, and knowledge creation. Furthermore, information and knowledge management in the organization is better practice in leadership capability and sustainability practice. This study will focus on the four main factors for ICT adoption in the company for the organizational performance in SMEs which are also the aims of business research. First, this study will suggest the SME's technological compatibility is linked with ICT adoption. Second, ICT adoption or use has a profound impact on knowledge creation. Third, Information and knowledge management system are highly influenced by the ICT adoption and finally suggest the internal and external factors to the barrier of ICT adoption in the SMEs in Bangladesh.

This study is structured into five sections as follows section 1 is the introduction. Section 2 is the literature review on the factors related to ICT adoption in the organization and possible barriers to organizational performance. Sector 3 hypothesis and research framework. Section 4 results analysis and discussion, and section 5 is the conclusion.

2. Literature review

Many studies have explored the relationship between ICT adoption and investment to link with organizational performance (Bayo-Moriones et al. 2013; Gatautis & Tarutė, 2014; Yunis et al, 2018; Ibrahim & Heng, 2015). The result of previous studies specifies that how ICT impact on the various aspect in the SMEs performance. Firstly, Strategic performance, innovation, and effectiveness (Barba-Sanchez et al, 2018). Secondly impact on learning, motivation, and self-efficacy (Lopez-Nicolas & Soto-Acosta, 2010). Finally effective internal and external communication (Bayo-Moriones et al. 2013), leadership, and sustainability.

2.1. Conceptual Framework: Theoretical orientation

Information communication Technology (ICT) adoption is stated as the use of information and communication technology tools including computer hardware, software, and networks which are required for connecting to the internet (Tan et al., 2009; Ghobakhloo et al., 2011). Earlier scholars (Nguyen, 2009; Rogers, 2003; Thong, 1999) identified three stages of the adoption of

ICTs namely initiation, adoption, and implementation. The initiation stage is working with assessing the ICT innovation. Moreover, adoption stage made decision to adopt an ICT innovation and finally, implementation stages is concerned with effecting the ICT innovation in the firm. Other studies by Dao et al. 2011; Carrera - Kurnia, 2015 stated that ICT adaptation into four phases, Automate, Information, Infrastructure, and Transformation. Therefore, it implies that ICTs are applied to enhance the operations of any organizations effectively.

Innovation is perceived to be significant measure for technology use and ICT adaption. In the study of Azadegan & Teich, (2010) describe that technological factors will be a technology feasible whether it is perceived effectiveness and easy to use are considered reasons for adoption.15 Dimension of technology factors based on DOI (Diffusion of Innovation) model. Rogers (1995) first introduces the DOI model, namely a popular model in investigation of the behavior of users in adopting new technological innovation. This model proposed five perceived characteristics of innovation which consists of *relative advantage, compatibility, complexity, trial ability and observability*. In addition TOE framework another most uses model in technological adoption model in previous study. Tornatzky & Fleischer (1990) proposed the TOE framework to explain the process of innovation in the context of an enterprise. It considers three features of an enterprise that influences the adoption of innovation - technology, organization and environment context.

2.2. Hypothesis development:

2.2.1. ICT and organizational capability

ICT is a major driver for innovation and corporate entrepreneurship which increases organizational performance and develop the existing process of innovation and competitiveness in the SMEs (Gatautis & Tarutė, 2014; Yunis et al, 2018). Even through, ICT adoption in SMEs can bring the benefit in terms of effectiveness, expansion and competitive advantage (Consoli D, 2012). Gatautis & Tarutė, (2014) highlighted that ICT has significance in three potential areas of performance; these are effectiveness, competitiveness, and growth of the organization in new transformation, and innovation in new business model and working process. Another study by Alam & Noor, (2009) found that ICT knowledge in SMEs offer a wide range of possibility to improving their competitiveness in order to create organizational capability.

An organization has been frequently examined ICT adoption in order to ensure its capability. Organizational level studies have examined the process of adoption and diffusion of IT (Pervan et al. 2005) assuming that ICT improves the organization's operational and strategic practices what requires an organization to be more efficient, innovative and more competitive in the market. All organizations want to remain competitive and retain their market share. A strong competitive advantage is driven by customer needs and aligns the organization's resources with its business opportunities (Neo, 2008). ICT speeds up work processes so that client response is enhanced (Capon, 2008). Use of ICT enables quick and timely delivery of services and products. Secondly, reductions in processing time can only be accomplished by streamlining and simplifying processes and value chains to eliminate non-value-added steps such as rework and waiting time (Capon, 2008) that improve the organizational capabilities.

H1: organizational capabilities have a significant influence on ICT adaption.

2.2.2. ICT significance in knowledge creation

Knowledge sharing is very essential component to develop the organizational learning and performance. ICT is a crucial element to influence sharing information to create knowledge and organizational learning (Karlsson et al. 2013). ICT significantly contributes to organizational

performance through knowledge creation (Lopez-Nicolas & Soto-Acosta, 2010). In the Swedish manufacturing industry, ICT has become a more significant component for knowledge creation and ensuring efficiency for the operators in the organization. A study by Hoque et al, (2016) explored that ICT adaption in SMEs has a positive impact on the behavioral change among the employees for creating confidence, self-belief, high level of motivation, and changes in attitude towards ICT practice for the better output. Furthermore, ICT adoption in the organization affects organizational flexibility in greater efficiency and the way many tangible and intangible benefits (e.g. human resource skill, experiences) in enterprises. Moreover ICT integration with human factors has provide the strategic resources in order to create sustainable competitive advantage in the firm (Ong & Ismail, 2008).

H2: Knowledge creation significantly impacts on ICT adaption

2.2.3. ICT impact on Sustainability

In the dynamic world, businesses are more challenging without technological advancement and technological compatibility is a major factor in organizational sustainability. Technological progress or ICT adoption in SMEs is a competitive tool for strategic performance. According to Santos & Brito (2012), ICT has a great direct and indirect impact on both financial performance and strategic performance. On one side, overall productivity, growth rate, and market value are the indicators for direct ICT impact on financial performance. On the other side, strategic or operational performance is closely related to the customers and employee satisfaction, social performance, and environmental performances are indirectly impacted by ICT adoption. Karlsson et al, (2013); Bayo-Moriones et al. (2013) revealed that ICT increases operator's competitiveness which has also ensured the company's competitiveness and increase operational performance. Management information system is another factor that affects ICT adoption in the organization. This information technology is more effective for communication at a different level and more efficient to coordination among various activates which also help to improve the information system in the company. ICT has indirect impact on improvement in the internal and external communication which leads to operational performance which ultimately increases performance in SMEs (Bayo-Moriones et al. 2013). Moreover, an information system is an effective management support tool to reduce the information gap and ensure effective coordination between internal and external entities in the organization. Study by Freeman & Hasnaoui, (2010) ICT enable resources has a capability to reshape the organization in internally simultaneously reform the way of interaction with external communication.

H3: Sustainable performance are positively impacted by ICT adoption.

2.3. Barriers of ICT adoption in SMEs

In the dynamic world, businesses are more challenging without technological advancement and technological compatibility is a major factor in organizational sustainability. Technological progress or ICT adoption in SMEs is a competitive tool for strategic performance. According to Santos & Brito (2012), ICT has a great direct and indirect impact on both financial performance and strategic performance. On one side, overall productivity, growth rate, and market value are the indicators for direct ICT impact on financial performance. On the other side, strategic or operational performance is closely related to the customers and employee satisfaction, social performance, and environmental performances are indirectly impacted by ICT adoption. Karlsson et al, (2013); Bayo-Moriones et al. (2013) revealed that ICT increases operator's competitiveness which has also ensured the company's competitiveness and increase operational performance. Management information system is another factor that affects ICT

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2.4. SMEs in Bangladesh

There was no unique definition in worldwide for SMEs, it differs from country to country based on the number of employees in the organization. The widely accepted definition note that small-sized enterprises are with 1to 50 employees and medium-sized enterprises is with 51 to 100 employees. In Bangladesh, SMEs are defined by various authorities for example the Ministry of Industry (MOI), Bangladesh Bureau of Statistics (BBS), and Bangladesh Bank. According to the Ministry of Industry (MOI), the small-sized enterprise is in manufacturing operation with a minimum number of employees 25 and maximum employees is 99 and medium-sized enterprise is in between number of employee is 100 to 250. For service and trading operation small sized enterprises are the number of employees 10-25 and medium-sized enterprise number of employees is 50-100. (Hoque et al. 2016).

3. Methodology

This exploratory study observes the phenomenon of the factors and the barrier of ICT adoption in SMEs in Bangladesh based on the previously published articles. This study develops the conceptual framework on the impacts and barriers of ICT adoption in SMEs in Bangladesh. In this research systematic analysis of previous articles and documents was selected to obtain a profound understanding of the phenomenon. Google scholar, research gate, science direct, and Scopus search were used as sources of data collection. The time frame for chosen document collection and analysis was the 2008-2020 period. Data collection was conducted by using the following keywords, “factors effecting in ICT adoption”, “ICT impact on SMEs performance”, and “ICT adoption barriers in SMEs in Bangladesh”. For data analysis, firstly 20 research papers were primarily selected for the analysis of the factors related to ICT adoption, secondly, another 15 articles were identified related to the barriers of ICT adoption in SMEs in Bangladesh. The main objectives of this study are to explore the factors which influence ICT implementation, to find out the barriers to ICT adoption n SMEs.

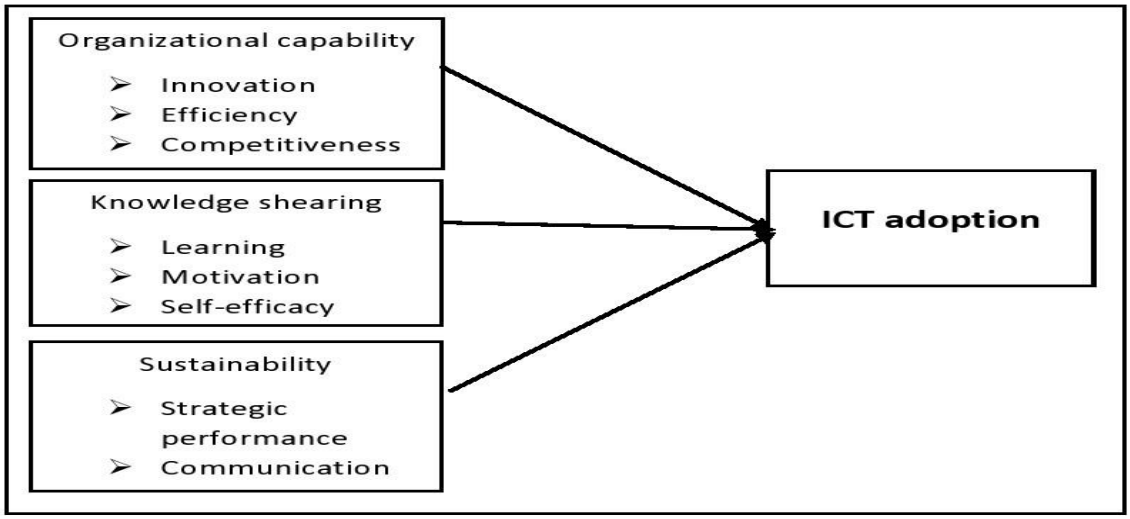
4. Result

4.1. Impact factors of ICT adoption in SMEs

In the previous study, there is a lot of studies that contribute to identifying the factors relating to ICT investment in SMEs. Information technology has a great significance in organizational capabilities to innovation and competitiveness, to improve the effectiveness and efficiency (Ong & Ismail, 2008). Moreover, ICT is the potential tool to generate a competitive advantage. Undoubtedly ICT has a great impact on facilitating the learning process. Moreover, the integration of IT-based tools in business has increase collaboration among the different parts of

the organization and with the partners to reduce the transaction cost and increasing the performance which influences the partnership governance structure. Moreover using IT resources has the unique capabilities to improve the organizational performance, internal process and facilitates the internal and external information to meet sustainability (Malaquias et al. 2016). However, after analysis of previous literature in factors related to ICT investment in SMEs are classified into three groups in (figure 1) organizational capabilities, knowledge creation, and sustainability.

Figure 1. Factors effect on ICT adoption.



Source: Author generated model, 2021

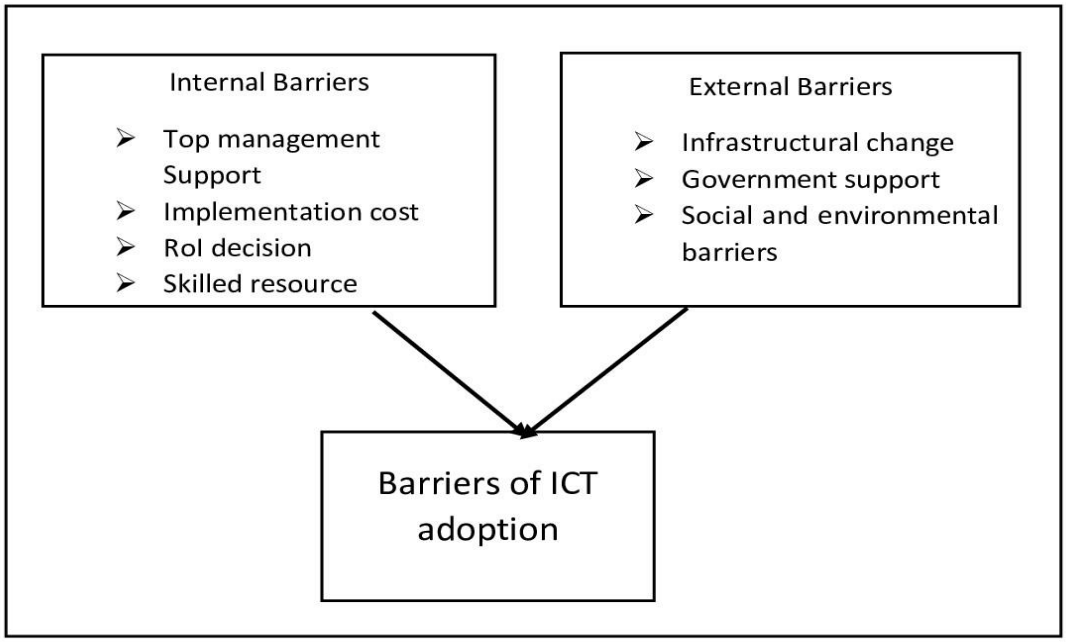
Table 1. Literature review on factors effect on ICT adoption

Group	Topic	Authors
Organizational Capability	Innovation	Yunis et al, 2018; Ollo-López & Aramendía-Muneta, 2012
Organizational Capability	Efficiency	Cakmak & Tas, 2012
Organizational Capability	Competitiveness	Karlsson et al, 2013; Gatautis & Tarute, 2014; Barba-Sanchez at al. 2018
Knowledge Sharing	Learning	Ibrahim & Heng, 2015; Narain, 2013
Knowledge Sharing	Motivation	Dao et al. 2011; Singh and Teng, 2016
Knowledge Sharing	Self-efficacy	Ibrahim & Heng, 2015
Sustainability	Strategic performance	Santos & Brito, 2012; Dao et al. 2011
Sustainability	Communication	Bayo-Moriones et al, 2013; Roldan and Wong, 2008
Sustainability	Leadership	Carrera and Kurnia, 2015.

4.2. Barriers of ICT adoption in SMEs in Bangladesh

The large organization has enough resources to adopt IT on the other hand SMEs have some limitations for ICT investment in developing countries like Bangladesh. The analysis of a previous study on SMEs in Bangladesh has found many internal and external barriers to ICT adoption. The previous literature has discussed the importance of ICT in SME development. Among all those researches adequate number study on SMEs in Bangladesh. Most of the studies ware develop and developing countries like Malaysia, India, and Thailand.

Figure 2. ICT adoption barriers.



Sources: Author generated model, 2021

Table 2. A literature review on barriers of ICT adoption in SMEs.

Group	Topic	Authors
Internal barriers	Top management support	Ashrafi and Murtaza, 2008; Moktadir et al. 2019; Islam and Nasira, 2017
Internal barriers	Implementation cost	Cakmak and Tas, 2012; Miraz and habib, 2016
Internal barriers	ROI decision	Hoque et al. 2016
Internal barriers	Skilled resources	Ibrahim & Heng, 2015; Riyadh et al, 2010; Roldan and Wong, 2008
External barriers	Infrastructural Change	Riyadh et al, 2010; Ojukwu, 2006
External barriers	Governmental Support	Moktadir et al. 2019;
External barriers	Social and environmental	Rahman and Kabir, 2019; Luftman et al. 1993

5. Discussion

Based on the literature review this research found various factors that influence ICT adoption in SMEs to maximize the business performance. The previous studies notice that ICT has a potential for organizational capability. Studies have found that factor for ICT adoption is not the same for all SMEs and similar ICT tools are not appropriate to serve the organizational purpose. ICT tools used by the manufacturing SMEs are not the same as the trading and service industry. However, some similar factors affect ICT investment in SMEs and observed the barriers of ICT adoption in SMEs in Bangladesh. Effective use of ICT resources can generate better organizational performance. ICT adoption in SMEs can enhance efficiency and effectiveness to gain competitiveness. Knowledge sharing is an essential component for creating new knowledge and important for organizational learning. ICT-based information technology gets more prominent tools for facilitating knowledge creation, learning, and motivation.

ICT is enabling the formation and assessment of innovation gathering, creating a knowledge network with customers, suppliers, and a process of learning (Dao et al. 2011). The information system is a source of intangible benefit and performance in the organization. These intangible benefits are categorized into internal and external benefits includes skilled human resources, experiences, and satisfaction. In different study has found that the investment of both tangible IT resources and intangible resources is a result of innovation, flexibility, efficiency, and profitability (Carrera & Kurnia, 2015). The collaboration within IT resources and Human resources are enabled to create sustainable capabilities for competitive advantage. In addition, IT make a strong effect on business by reducing cost, increase the quality of service and product, integrate the whole supply chain into an operational network, and also enable organizational learning. IT is a valuable tool for organization practice to improve the quality of the workplace, enhance employee knowledge, employee satisfaction, and wellbeing.

Table 2 presents the most common barriers to ICT adoption in SMEs in Bangladesh. It is obvious that external barriers usually are caused by government support and policy, social and environmental issues, political barriers, and infrastructure; in the meantime, internal barriers usually can be easily removed or changed due to progress. SMEs faces various barriers to ICT adoption partly since SMEs usually have a lack of tangible and intangible resources, lack of technology compatibility and capabilities although the less complicated structure allows smaller companies more flexibility to changes.

6. Conclusion

The focus of this study was to analyze the relationship between factors of ICT adoption and to identify any underlying factors for barriers of ICT adoption in SMEs located in Bangladesh. The process of ICT adoption in SMEs is very complex and it is impacted by the flowing condition of perceiving outcome of business (new product and service innovation, efficient use of resources and gain competitive advantage), knowledge management (employee and customers motivation, facilitating the way of learning) and organizational sustainability (social and environmental performance, effective communication and leadership development). Based on the result of this study will help to overcome the identified barriers in the future. To sustain in the competitive market, it will help to identify the way to increase technological awareness among SME owners and also help to adopt potential technologies in long term process.

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Zero Waste Consumer Behaviour in Slovak Republic

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Abstract
As is well known, the world today is struggling with a large number of environmental problems, most notably the huge production of waste. This production of waste is constantly growing, and that is why various new challenges are emerging that we, as human beings, have to face. The response to this environmental problem is a philosophy, which we call zero waste. In this research we analyzed consumer behavior of zero waste consumers using data from questionnaire survey. For outputs and analysis were used SAS and Microsoft Excel. According to the results of the questionnaire survey, we can describe the differences in consumer behavior in the food market between consumers, who are referred to as zero waste consumers and between "no zero waste consumers". As the first difference, we can identify the place of purchase and also frequency of purchases. We can see that zero waste consumers buy less than once a week at 25.37% and at the same time these consumers spend 82.69% on food less than 25% of household income and 7.69% even less than 10% of income compared to 5.91% no zero waste for consumers who buy less than once a week, while at the same time these consumers spend less than 25% on income but not less than 10% and 25% more than 50% on income. Also, we can state that there is dependences between the ZW preference and the percentage of income spent on food purchases and between ZW preference and the frequency of food purchases.

Keywords: *zero waste, consumer behaviour, food market,*

JEL Classification: *C14, E20, Q56*

1. Introduction

According to the Statistical Office of Slovak republic (2019), in 2019 municipal waste in Slovakia amounted to 434.63 kg/capita per year, while in 2015 it was 348,33 kg/capita (SO SR, 2015). However, according to the data of the same source, in 2015 the sorted municipal waste represented 105,79 kg/capita and in 2019 it was 198,22 kg/capita. While we can see the increase of sorted municipal waste on the other hand it is important to realize if it is sufficient when increase in waste is still in big numbers.

Other thing important to realize is that the best way to reduce waste and act ecological is understanding of consequences.

Sustainable consumer behavior has not only one form, this behavior including environmental friendliness (Antonides, 2017), the interest in green product and also fair-trade label (Maaya et al., 2018), or when consumer is willing to pay for local products and food (Schmitt et al., 2016).

Research about Green purchase behavior showed that young consumers expected direct gains while limiting expenditures. It is critical to educate this demographic about the environmental benefits when making a purchase. Companies must create creative goods that blend ecological and functional attributes. It is critical to lessen the distance between green products and marketing messages to youthful customers. The legitimacy of the message is an

important consideration when developing a marketing message for an ecologically friendly product for this demographic. The increased involvement of the media and other organizations in this market will raise environmental awareness in this market sector. Reducing the conflicts between hedonistic, economic, and environmental motivations among the younger population is an essential part of managerial work. (Witek & Ku´zniar, 2021)

1.1. Zero waste

One of the sustainable lifestyles is also a philosophy which is trend of the last years. Zero waste was first mentioned as a philosophy in the mid-1970s by chemist Paul Palmer. The first historical roots of the zero-waste concept go back to ancient cultures that managed to economically manage and return organic waste back to the soil, which were purchased in their own containers. (Karasová, Škrdlíková, Gajdošová, 2019)

The Zero Waste International Alliance (ZWIA) has promoted the zero waste idea and concepts, as well as produced associated legislation, with the purpose of raising awareness in society and industry about the benefits received when waste is viewed as a resource. (ZWIA, 2015). The ZWIA defined zero waste (2018) like: "Zero Waste: The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health." (ZWIA, 2018)

2. Data and Methods

A questionnaire was used to collect data from quantitative research which was divided into two parts. The first part, primary research, was focused on classification questions concerning the respondent himself (age, education, etc.), while maintaining its anonymity. The second part, secondary research was focused on questions which were aimed at essential issues related to the purpose of the research. The second part was divided into two parts – for no zero waste consumers and for zero waste consumers. Thanks to this filtration we were able to compare consumer behavior between zero waste consumers and no zero-waste consumer which led us to identification of factors influencing zero waste consumer behavior in Slovakia.

According to the calculation of the sample size and setting the confidence level at 95% we determined the sample size and thus the minimum number of respondents to be able to analyze the data and draw a conclusion. We set this minimum based on the following calculation:

$$n = \frac{Z^2 \times p \times (1-p)}{c^2} \quad (1)$$

where:

n – sample size

Z – value derived from statistical tables (for the 95% confidence level is equal to 1,96)

p – character ratio, for unknown values is p=0,5

c – acceptable margin of error

After substituting the values determined by us into the formula the minimum size of the sample is equal to 384.

The object of the research was 408 respondents and thus the minimum size of the sample was met at the level of reliability and error range set by us. A total of 205 women and 203 men answered. In terms of age representation, the largest proportion was in the age range of 26-35 years, and the smallest representation was in the age range of up to 18 years. The MS Office Excel 2016 program was used to process the data obtained from the questionnaire survey. In order for the primary data to be evaluated, we used calculations of basic statistics.

In the part of the evaluation of questions from the questionnaire, we used contingency tables, while contingency tables are tables used for a clear and well-arranged summary of the relationship between two or more statistical features.

2.1. Chi-square test of independence

When testing associations, we find out whether between the given attributes, there is a dependence. This dependence was examined on the basis of a questionnaire survey among zero waste consumers.

When examining the dependence between the attributes we verify the following hypotheses: Null hypothesis: There is no associations between two variables.

Alternative hypothesis: There is an association between two variables.

The test criterion is expressed by formula (1):

$$X^2 = \sum_{i=1}^{m} \quad \sum_{j=1}^{r} \frac{(E-T)^2}{T} \quad (1)$$

We analyzed the strength of the dependence according to the following formulas for the Pearson coefficient (2) and the Cramer V-coefficient (3).

$$C = \sqrt{\frac{X^2}{n+X^2}} \quad (2)$$

Where:

n expresses the total number of measurements

X2 expresses the calculated test criterion

$$V = \sqrt{\frac{X^2}{n(\min((m,r)-1)}} \quad (3)$$

Where:

m - expresses the number of lines

r - expresses the number of columns

2.2. Mann-Whitney U test

The Mann-Whitney U test is a nonparametric test. It is used for ordinal data when two samples are independent. (Pacáková,2009) Calculation of test characteristics according to formulas:

For the first sample: $U = n_1 \times n_2 + \frac{n_1 \times (n_1+1)}{2} - R_1$ (4)

For the second sample: $U = n_1 \times n_2 + \frac{n_1 \times (n_1+1)}{2} - R_2$

where:

n1 – total number of the first sample,

n2 – total number of the second sample,

R1 – sum of the order of the first sample,

R2 – sum of the order of the second sample,

Analyzes were performed at the selected level of significance alpha = 0.05.

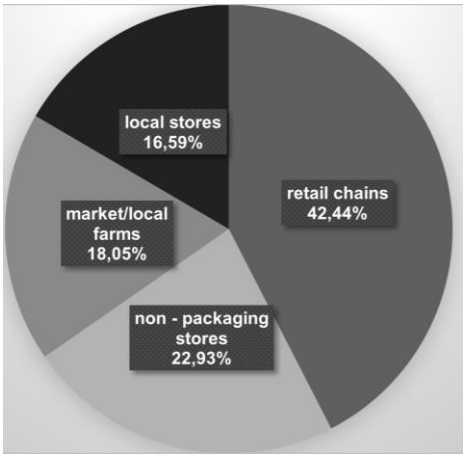
3. Results and Discussion

To respondents was explained what zero waste is and then 205 of them answered that zero waste is the lifestyle they prefer, and 203 respondents described themselves as no zero waste consumer.

When we asked, "Where do you buy food most often?", the most frequent answer was "in retail chains". This answer was given by 87 respondents (42.44%). In non-packaging stores it

was 22.93% (47), on the market or from local farmers it was 18.05% of zero waste consumers and 16.59% in local stores.

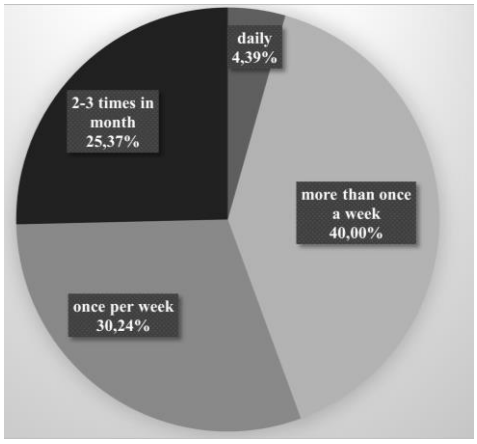
Figure 1. Place of food purchase



Source: author´s calculations

The second question for consumers was focused on the frequency of purchases, with an emphasis on counting every single purchase of food, even the smallest one. Most respondents answered that they shop more than once a week, equal to 40%. 30.24% shop once a week and 25.37% shop 2-3 times a month. The fewest respondents stated that they shop daily = 4.39%.

Figure 2. Frequency of purchase



Source: author´s calculations

Third question was about percentage share of the income spent on the purchase of food, most respondents (106) answered that they spend 10-25% of the income on the purchase of food. 33.17% of respondents spend 25-45% of household income on food purchases. 8.29% of respondents spend approximately 50% of their income on food purchases and 5.85% of respondents spend less than 10% of their income on food purchases. The fewest respondents said that they spend more than 50% of their income on food purchases 0.98%.

Table1. Percentage share of the income spent on food purchase

% share of income spent on FP	Number of respondents	%share of respondents
<10%	12	5,85%
10-25%	106	51,71%
25-45%	68	33,17%

cca 50%	17	8,29%
>50%	2	0,98%
SUM	**205**	100,00%

Source: author´s calculations

Table 2 shows the arrangement of factors according to how they affect the respondent. Weight 1 is for the least influential and 5 for the most influential. From this table it is possible to read the following: in 5th place, the most frequent respondents indicated their own experience, in absolute terms 111 (54.14%) and in absolute terms 77 (37.56%) respondents indicated the impact on ecology. In fourth place, the impact on ecology (36.59%) and personal experience (30.73%) were again the most frequently reported. In third place were references from family/others in absolute terms 90 (43.90%). On the second place, respondents most often mentioned promotions / discounts (34.15%) and packaging design (27.32%). 57.56% of respondents identified the design of the packaging and 24.39% respondents identified the promotion / discount as a factor which is the least influencing. In summary, we can deduce that these consumers are most influenced by their own experience and impact on the environment, and least affected by packaging design and promotions / discounts.

Table 2. Factors influencing consumer behavior

Factors	1	2	3	4	5
Own (personal) experience	12	7	12	63	111
References from family/others	25	57	90	29	4
Design of packiging	118	56	15	10	6
Promotions/discounts	50	70	50	28	7
Impact on ecology	0	15	38	75	77

Source: author´s calculations

Based on the answers, we can say that 64.39% - in the absolute number of 132 respondents stated the greatest importance when buying food is the freshness, the least respondents stated the greatest importance in the possibility of nutritional value, in the absolute number of 10. In the second most important place was country of origin in absolute abundance 67 which is a relative abundance 32.68%. This place, and thus the place with the weight of 4 least respondents, mentioned the possibility of the designation Vegan. In the neutral place (3), most respondents mentioned the option Country of origin and nutritional values. In the second place of importance, the respondents most often indicated the nutritional value in the absolute number of 72. Lastly and therefore the least important for zero waste consumers was the label Vegan in the absolute number of 100, while in the absolute number of 64 they indicated the price.

Table3. Importance of factors

Factor	1	2	3	4	5
Price	64	49	44	34	14
Freshness	3	10	15	45	132
Label VEGAN	100	40	15	29	21
Country of origin	9	34	67	67	28
Nutritional value	29	72	64	30	10

Source: author´s calculations

DependencesH1: We assume that there is a statistical dependence between the zero-waste preference and the frequency of food purchases.

H0: There is no statistical dependence between the zero-waste preference and the frequency of food purchases.

Table 4. Data for calculation chi square

Frequency of purchase	Do you prefer	zero waste?
	YES	NO
Daily	9	17
More than once a week	82	118
Once a week	62	56
2-3 times in month	52	12

Source: author´s calculations

The test characteristic reached a value of 34.22, critical value = 7.81. Based on the results, we can state that the frequency of zero waste consumers' food purchases is statistically significantly dependent on the preference zero waste lifestyle. Based on the results of comparison criteria, which the intensity of dependence can confirm a weak dependence (Pearson's coefficient = 0.378, Cramer's V coefficient = 0.167).

H1: There is a relationship between the zero-waste preference and the percentage of income spent on food purchases.

H0: There is no relationship between the zero-waste preference and the percentage of income spent on food purchases.

Table 5. Data for calculation chi square

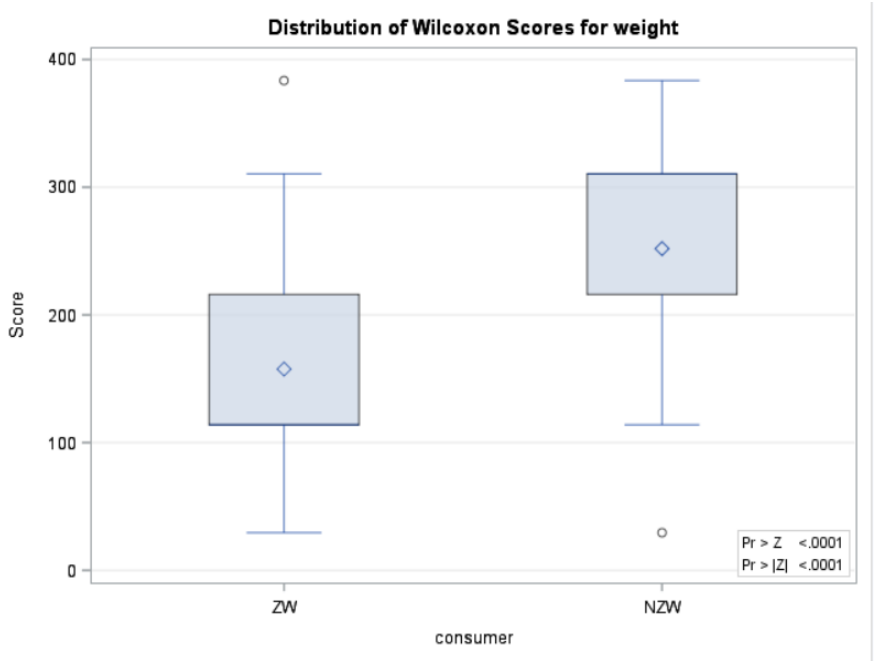
% share of income spent on FP	Do you prefer	zero waste	?
	YES	**NO**	**SUM**
<10%	12	3	**15**
10-25%	106	50	**156**
25-45%	68	81	**149**
cca 50%	17	50	**67**
>50%	2	19	**21**
SUM	**205**	**203**	**408**

Source: author´s calculations

The test characteristic reached a value of 56.64, critical value = 9.488. Based on the results, we can state that the frequency of zero waste consumers' food purchases is statistically significantly dependent on the preference zero waste lifestyle. Based on the results of comparison criteria, which the intensity of dependence can confirm a weak dependence (Pearson's coefficient = 0.349, Cramer's V coefficient = 0.186).

SAS software using Mann-Whitney U test, was used to detect differences in the behavior of respondents by zero waste lifestyle preference, and we assumed that there was significant difference in the assessment of the discount factor between zero waste consumers and no zero waste consumers. Based on the results, we can say that our assumption was incorrect (test characteristic = 8.28, P-value = j 0.0001), which means that zero waste consumer and no zero waste consumers behave significantly different when buying stock, respectively discounted products. From Figure 4, it can be seen that no zero waste consumers were more influenced by the price factor when buying food than zero waste consumers.

Figure 3. Boxplot by preference zero waste



Source: author´s calculations in SAS

4. Conclusion

The priority was to examine zero waste consumers when buying food. We compared the results of both categories of consumers. We can describe the differences in consumer behavior in the food market between consumers who are referred to as zero waste consumers and between "no zero waste consumers".

The first difference can be identified by the place of purchases. While zero waste consumers buy in retail chains in less than half of the cases and in non-packaging stores in 22.93%, ot the other hand we can state that no zero waste consumers have ¾ predominance of purchases in retail chains and in 18.72% buy in local foods, while in non-packaging store buys only a negligible percentage.

In the frequency of purchases, we can see that zero waste consumers buy less than once a week (at 25.37%) and at the same time these consumers spend 82.69% on food less than 25% of household income and 7.69% of them spend even less than 10% of income compared to 5.91% no zero waste consumers who buy less than once a week, while at the same time these consumers spend less than 25% of income but not less than 10% and 25% more than 50% income . We can see that the freshness of food is important for both categories, but no zero waste consumers is greatly affected by the price of products, while zero waste consumers is affected by the country of origin and the price affects them in minimal quantities. With regard to the factors that affect consumers, we can deduce that personal experience is very important for both categories of consumers, but the difference is in the factor of promotions / discounts and the impact on the environment.

While discounts and promotions have greater impact on no zero waste consumers and the impact on the environment affects them minimally, on zero waste consumers have discounts and promotions a minimal effect but on the other hand they are very affected by impact on the environment. We can also state that no zero waste consumers are more interested in the experience of family and others, while zero waste consumer is much less affected by this factor.

In summary, this means that the Zero waste lifestyle influences consumer behavior in the food market to a large extent. Zero waste consumer is more interested in where the food comes

from, which is closely related to the environmental impact, more than the price, promotions and discounts. This consumer is interested in the essentiality of this food. With each purchase, these consumers wonders whether they really need a particular food, how much of that food they need, what impact the packaging of this food has on the ecology. They buy according to a pre-written list that they follow. If this food is in the packaging, they are interested in what other purpose this packaging can fulfill. If a given food does not meet the mentioned requirements, then this consumer is not interested in the experience with the given food of family or acquaintances, nor in other factors. All this information is necessary for the trader, as marketing activities will be visibly different if we want to attract such a consumer. It will not be effective for this consumer to apply non-organic packaging or non-essential food advertising such as mega packs, promotions and discounts, various sales, nor will it be effective to apply a strategy of appeal to the child customer as the zero-waste parent is firmly committed to zero waste principles. If the target group is zero waste consumer, it is necessary to focus all activities only on those foods that themselves and their packaging meet the requirements of this consumer. Advertising in the field of ecology, ecological packaging and support for various charitable or charitable events focused on ecology can be an effective way.

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The Development of Agriculture in the Context of its Financing through Bank Loans in Bulgaria

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Abstract

The purpose of the article is to study in theoretical and practical aspects the trends in the development of agriculture and its financing from bank sources.

As a result of the research, the need to stop the process of consolidation of the used agricultural areas from 1 farm can be determined; facilitating farmers' access to bank lending through various preferential banking conditions; opening a credit bureau that will promote transparency of credit information.

The study of weaknesses in lending regarding agricultural enterprises provides an opportunity to review specific policies and strategies.

Keywords: *agriculture, average utilized agricultural area, bank loans, credit bureau, credit registry, relative share of bank loans, small farms.*

JEL Classification: *G21, O13, Q10*

1. Introduction

The production of agricultural products is the most extensive and vital branch of the national economy. It produces food products of plant and animal origin, as well as raw materials for industry. The food production is a key condition for the existence of mankind and for any production, or there is no denying the great importance of agriculture.
Various authors have worked on this topic. The author Valentin Boshkilov (Boshkilov,2018) identifies the following imbalances in agriculture:

1. Imbalance in terms of financial resources under the two pillars of the Common Agricultural Policy (CAP), i.e. uneven distribution of the huge financial resource.
2. Imbalance in relation to the structure of agricultural holdings, i.e. continuing the trend of forming and establishing a small number and sustainable large farms and a large number of uncertain small and medium-sized farms.
3. Imbalance in terms of the possibilities for absorption of the funds under the two pillars of the CAP by the agricultural holdings.

Vlaev (Vlaev, 2018) has analyzed the more important structural changes in the bank lending of agribusiness in Bulgaria for the period since Bulgaria's accession to the EU and to identify the potential problems and challenges as a result of the economic crisis in our country, on this basis to propose recommendations for improving the financing of the sector.

Nikolov, D. and team (Nikolov, 2013) identify the main competitive determinants of small farms and provide applicable proposals for achieving sustainable competitiveness of these farms.

Andriushchenko K. and team (2019) have summarized that in many respects, the development of Ukraine’s financial and credit infrastructure offers favorable prospects for access to the sources of credit, finance and investment necessary to continue the modernization of agricultural enterprises.

Sotonye, G. and Nwanyanwu, D. (Sotonye, 2020) think that the agricultural sector should not be left out in the scheme of banks' lendings as they have shown to benefit more from these loans and have also increased in terms of more entrepreneurs springing up over the years and there should be a national data base of registered farmers and their loans history.

Rozhko, O.D., Marenych, T.H., Onegina, V.M., Belyayeva, L.A., Maliy, O.G. (Rozhko, 2019) also present their points of view on lending to the agricultural sector. Authors have concluded the share of agriculture in total crediting is less than the contribution of the agriculture into the formation of gross value added in the country in recent years. They have proved that the volume of bank crediting was insufficient for the financial support of operational and investment activity of agricultural enterprises in Ukraine.

The purpose of the article is to study in theoretical and practical aspects the trends in the development of agriculture and its financing from bank sources.The main tasks in this article are:

- presentation in theoretical and practical-applied aspect of the agricultural farms in Bulgaria.
- discussion of the types of agricultural loans granted by financial institutions.
- analysis of lending trends for a 5-year period (2016-2020 inclusive).

The author's hypothesis, which will be confirmed in the article or rejected, is that agriculture encounters certain difficulties in financing by the banking sector.

2. Data and Methods

The research methods in the article are specified to the analysis of real data in the sector on the average utilized agricultural area, as well as the analysis of loans provided by banks to farms. The other methods used are synthesis the information on the activity of the farms and the credit activity of the banks; statistical methods are used as a coefficient method and data growth rate on loans for a 5-year period. The scope of the monitored financial institutions covers over 70% of the total number of banks.

3. Results and Discussion

According to the data of the Ministry of Agriculture, Food and Forestry (MAFF, 2021) from the census conducted in 2020, it is established that the farms on the territory of the country are 132,400, and the used agricultural area is 3,957 000 ha. As follows, the data from the census for 7 non-consecutive years are presented in in a table 1:

Table 1. Agricultural farm by years

Years	Number of agricultural farms
2003	665 500
2005	534 600
2007	493 100
2010	370 200
2013	254 100
2016	201 000
2020	132 400

Source: Ministry of Agriculture, Food and Forestry, Internet resource - https://www.mzh.government.bg/bg/

The utilized agricultural area per farm, as an average, varies over the years and is illustrated in the following table:

Table 2. Average utilized agricultural area (UAA) of land farm

Years	Utilized agricultural area (ha)
2003	4
2005	5
2007	6
2010	10
2013	16
2016	21
2020	33

Source: Ministry of Agriculture, Food and Forestry, Internet resource - https://www.mzh.government.bg/bg/

The number of farms decreased for the studied years, the change being as follows (on a 2003 basis): for 2005 - a negative increase of 20% was observed; for 2007 - negative growth of 26% was observed, for 2010 - negative growth of 44% was observed, for 2013 - negative growth of 62% was observed, for 2016 - negative growth of 70% was observed, for 2020 - negative growth of 80% was observed . The reasons for these results, according to Eurostat, are reduced to the consolidation of farms, which is part of the general trend across the EU. [2] Over-consolidation of the earth is a process that can be observed throughout Europe. In 2013, only 3.1% of farms in the EU controlled 52.5% of utilized agricultural area (UAA); 76.2% of farms have access to only 11.2% of UAA. Between 2003 and 2013, the EU lost 1/3 of its farms: from 12 million to 8 million (Eurostat, 2021).

Trends in land overcrowding have led many European governments to take action against and / or prevent the negative effects of this process, but in Bulgaria policies remain focused on helping to consolidate the sector. The fact is that the concentration of land in the hands of a small number of producers distorts production and market processes and may have an adverse effect on agriculture in the Union as a whole. The problem is already recognized at European level. In April 2017, the European Parliament adopted a resolution recognizing the problem and prescribing a number of possible reforms to address it (Nikolov, 2013). Along with the others, the main recommendations are:

"a/calls on the Member States, in order to attain the objectives of the CAP, to give small and medium-sized local producers, new entrants and young farmers – while ensuring equal gender access – priority in the purchase and rental of farmland, including pre-emptive rights where established, as the ownership of as much as possible of the land they farm is in the interest of a sustainable and reliable development of their farms, particularly at a time when non-farmers are increasingly interested in purchasing agricultural plots, very often for purely speculative purposes; encourages the Member States to promote small-scale family farms and sustainable production methods;"

b/considers that local communities should be involved in decisions on land use;"

The reasons for the consolidation of farms can be sought in 2 directions:

First of all, with the establishment of the World Trade Organization, international trade in agricultural products has been included in the liberalization negotiations for the first time. This is the reason the large farms, which are heavily subsidized by the state, enter into unequal competition with weaker producers . The consolidation of the sector at a global level is gradually deepening.

Secondly, subsidizing agricultural production increases the appetite of large tenants. The real winners are the tenants, not the landowners.

Bulgaria is no exception to the above trends.

According to Table 2, the following results are obtained:

The average usable agricultural area per 1 holding for 2020 on the basis of 2003 marks a positive increase of 725%. It is necessary to specify that the utilized agricultural area is the area used by the holding, regardless of its ownership - own or rented, leased or other forms. UAA

includes agricultural land, perennials, family gardens and permanent grassland, which are used only by the monitored farm;

- For 2016 on the same basis the positive growth is 425%.
- For 2013 - are reported positive growth of 300%.
- For 2010 - there is a positive increase of + 150%.
- For 2007 - an increase of + 50% is reported.
- For 2005 - an increase of + 20% is reported.

As can be seen from the results, the growth rate is significant. This also confirms the exported information for the whole EU related to the consolidation of agricultural farms.

Significantly decreases the number of farms with usable agricultural area below 10 ha compared to 2010. The largest decrease (80%) of farms with UAA to 1 ha. About 9% of the holdings (with 50 ha and more UAA) manage 85% of the UAA. Their number increased by 28% compared to the 2010 census (MAFF. 2021).

Agricultural farms in Bulgaria can be divided into 2 major groups:

- 1 group - a large number of small farms, cultivating a small part of the used agricultural area;
- 2 group - a small number of large farms cultivating a significant part of the utilized agricultural area.

In this case it can be emphasized that Bulgarian agriculture is characterized by a dualistic structure regarding of farm size.

Small farms are also of social importance due to the provision of jobs in areas where there is no other livelihood. Stimulating their activity should be just as important as stimulating the overall agricultural activity in a particular country. The small farm usually differs from the others in the number of animals or UAA. The characteristics of small farms are defined in the literature as (Bumbarova and member, 2007):

- MFA as a legal form is usually a sole trader or a completely natural person. However, this is not always mandatory;
- The income from agriculture of the Ministry of Foreign Affairs is part of the total income of the agricultural household of the manager of the Ministry of Foreign Affairs;
- The cases in which the share of the income from the Ministry of Foreign Affairs in the structure of the total income of the agricultural household occupies a relatively high relative share are increasing.

On the other hand, there are large farms (e.g. there are 304 000 farms in the EU), which produce an annual value of over 250 000 euro. They are less than 3% of the total number of farms in the EU, but produce almost 56% of the total agricultural production in the area. These farms are characterized by large agricultural enterprises, two or five of which are registered as holdings, i.e. not a family business.

More than half of the farms in the EU grow cereals, fruits, vegetables, vines, orchards, etc. One quarter is specialized in livestock breeding, and one fifth is a mixed breeder.

However, in order to the farms develop, a certain financial resource are needed. Funding comes from 3 sources: self-financing, bank credit or state aid (BNB, 2016-2020). Self-financing is extremely difficult in this sector due to the vulnerability of certain risks - diseases, fires, floods, hail, icing and others. Profits are not high due to the short durability of agricultural products. Regarding the receipt of investment funds from the state in connection with EU programs, although most farmers rely on such funds, it should be noted that subsidizing the development of agriculture in our country requires compliance with strict procedural rules, which often obstruct producers. All this is a major prerequisite for increasing the demand for bank loans, which in recent years have been the main source of working capital financing of the agricultural sector.

According to a study by the EC and the ECB (SAFE Report 2019), bank financing is the main source of external financing for 42% of enterprises, compared to the EU average of 48%. During the period from April to September 2020, 15% of the enterprises in Bulgaria have sought financing from a commercial bank, 5% have not sought such due to the expectation of refusal. Although agriculture is a traditional sector for Bulgaria, there are currently no specialized commercial banks in the sector. In general, the products offered to the sector are related to the assets being purchased. Sector-specific products are the purchase of land, a working capital loan against a pledge of subsidies and loans for the implementation of projects under the Program for Development of Agricultural Areas.

Table 3. Relative share of banking products in agriculture

Kind of loan product	Relative share of banks offering the loan product
Business expansion products - Purchase of farm animals; Purchase of agricultural land, construction of production facilities - dairies, milking parlors, workshops, etc.	50%
Working capital loans - working capital financing - for fuels, oils, lubricants, chemicals, herbicides, pesticides, repair, maintenance, etc.	70.8%
Credit lines for payment with suppliers	25%

Source: the author's own calculations

The table shows that the largest percentage of credit institutions provide working capital loans. Over 80% of this type of loans are secured through subsidies, which will be received under the State Fund "Agriculture" under schemes and measures of the Common Agricultural Policy and the Common Fisheries Policy of the European Union. The provision of this type of financial product to farmers is subject to certain conditions.

The approval of the loan is carried out under the conditions of the application of the farmer for direct support for subsidies to the State Fund "Agriculture". The utilization of the financial resources is possible to be done once for the whole amount or to transfer the amount in several tranches depending on the requirements of the owner's activity. The amount of the loan is in line with the level of expected support through the receipt of subsidies and can reach up to 95% of the amount of support from the Agriculture Fund. The repayment period is also negotiable - it is possible to repay once when receiving the subsidy or repayment during the period of agricultural activity and final repayment at receiving the subsidy. A collateral is established by establishing a pledge on the receivables of the borrower who has an open bank account, or signing a promissory note on the total amount of allocated financial resources.

The next type of loans are investment loans, which are key for farmers. One of them is to buy land. The term of the loan usually varies up to 15 years. There is also a grace period for the principal of up to 12 months. The repayment is made with an individual repayment plan, consistent with the capabilities of the business. The collateral is a pledge of the newly purchased agricultural land or other collateral acceptable to the bank. The advantages of giving this type of loan are:

- quick and easy access to working capital financing;
- quick procedure for analysis and evaluation of the borrower;
- more favorable credit conditions than standard loans;
- convenient current loan servicing, without the need to visit a monthly office of the bank;

No presentation of supporting documents for utilization;

Opportunity for early repayment of the loan without penalty fees.

Investment loans for the acquisition of agricultural machinery are often sought by owners of large farms due to: the high percentage of financing based on the invoice value for new or market valuation of used assets; the lack of a requirement for additional collateral for loans to finance assets up to 6 years of age, as of the first registration; the attractive price conditions and the possibility to use under preferential conditions additional non-credit and insurance products; the additional VAT financing on the purchase of the asset; the possibility for repayment under an individual repayment plan according to the income from the activity.

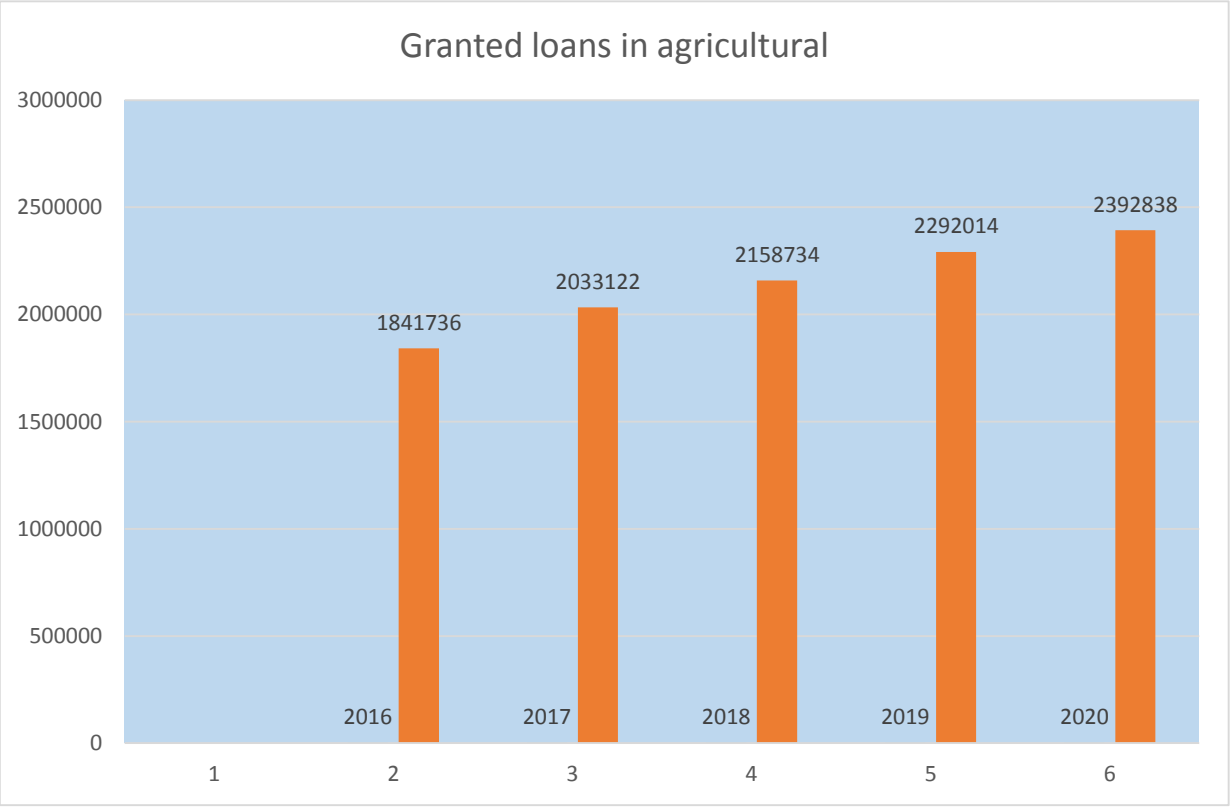
Farmers and stockbreeders can expand and modernize their farms through this loan.

It is provided in the form of a term loan for up to 60 months for the purchase of new or used agricultural machinery, attached inventory and equipment.

Only 1/4 of the banks provide credit lines for payment to suppliers. Credit lines make it possible not to block the working capital of suppliers and not to hinder their activities. The credit line is the maximum amount of credit that a farmer or stockbreeder can withdraw within a certain period of time. Under this type of contract, the farmer may repeatedly withdraw funds and pay them within the period during which the contract between him and the financial institution is valid. The interest rate due is charged only on the amount of credit used, not on the maximum allowable amount of the credit line. Often, when negotiating a credit line, the consumer is provided with a credit card with which to make his payments.

After own research of all operating banks in Bulgaria, it is established that 70% of the banks in Bulgaria provide loans to farmers. This means that there is sufficiently effective competition between financial institutions in relation to the banking products provided. Loans are long-term and short-term with different types in terms of maturity, grace periods, collateral and others. This should encourage farmers to use loans to stabilize their activities. But is that really the case? Information can be obtained from Figure 1:

Figure 1. Loans granted by the bank in agriculture



Source: Bulgarian National Bank, Annual report 2016, 2017, 2018, 2019, 2020

The following conclusions can be drawn from the graph:

- for the 5 surveyed years as a total amount the loans granted to farms increase;
- for 2017 compared to the base 2016 the positive growth is 10.39%, for 2018 compared to 2016 it is 17.21%; for 2019 compared to 2016 it is 24.45%; for 2020 compared to 2016 the increase is already 29.93%.
- the average amount of a loan varies from BGN 181 000 up to BGN 184 000[6]

Determinant for agricultural loans during the study period is the stable demand for medium-sized loans. Demand for smaller loans from farms stems mainly from the following problems:

- high need to provide funds for current needs as a result of the long production process in the sector;
- certain barriers in fulfilling the requirements of banks for granting loans;
- the need to operate and use loans only if the farmer has his own funds.

The total amount of loans granted by the banking system increased from BGN 49,224,773 000 (2016) to BGN 6,150,359 000. (2020). Or the positive growth is 24, 9%, which means that as a relative share agricultural loans do not increase. Calculations show that the latter range from 3.74% to 3.89% as a share of total loans.

According to BNB data, the largest number - 2,130, are loans amounting to between BGN 50 and 100 000, closely followed by loans amounting to between BGN 100 and 250 000, which are 2 124 in number. Nearly 360 are the loans of the sector, which exceed BGN 1 million. The figures show again that medium and small loans are a priority in the sector.

Where does BDB, as a state bank, fit in the context of lending to agricultural holdings? BDB's mission is to support and support the development of business in Bulgaria with a focus on micro, small and medium enterprises. The first and main function of development banks is to provide access to financial resources to those participants in the economy who can not get financing through standard market financial institutions, primarily commercial banks. In this capacity, development banks contribute to economic growth and development.

Agriculture and tourism are mentioned as part of the focus in the activity of the Bulgarian bank. In this aspect, the credit exposure to the Agriculture, Forestry and Fisheries sector amounts to BGN 30.4 million (3.4% of non-financial corporations).

At the end of 2015, the Bulgarian Development Bank launched a program for lending to Mutual Credit Cooperatives of private farmers, united in the National Cooperative Union / NCU / Eurostart. The aim of the program is to stimulate agricultural producers, who by their nature are micro and family enterprises, by indirectly giving them access to a relatively cheap credit resource to support their activities. By concluding a financing agreement with the Bulgarian Development Bank, the cooperatives undertake to provide the funds to their members at an interest rate not higher than 7%.

For the last year2020 in connection with COVID, the BDB pandemic has provided 41 loans in the sector with a total value of BGN 56 015 000. As a relative share, this amount represents 4.4% of the total amount of loans (World bank, 2021). For previous years, the volume of loans did not exceed 4%.

The reasons why the relative share of agricultural loans is so low can be summarized as follows:

a) according to the data from the performed analysis, the financial aid under the Rural Development Program in Bulgaria can cover from 50% to 80% of the costs of the producers. [9] The remaining funds should farmers receive in the form of bank loans. Obstacles to the use of such are -insufficient capital, especially for young landowners; the lack of preferential loan terms; in cases where the loan requirements are met, this only applies to short-term loans, ie. it is not possible to use investment loans.

b) the use of long-term loans by farmers has a very low positive rate for the studied 10 years due to the lack of collatera*l.*

For the researched 5-year period BDB grants credit lines in the amount of up to BGN 100 million. The purpose of the funds is to support farmers for short-term, working capital financing of their agricultural activities, as well as long-term investment support for their future investment intentions. It is also possible to refinance old sub-loans in the amount of up to 25% of the total amount of the agreed credit line. The interest rate is agreed with the farmer individually depending on the specifics and parameters of the transaction, but is not higher than 5.75%.

Regarding lending in Bulgaria, it is necessary to pay attention to the indicator "doing the business", set by the World Bank. (World bank, 2021). It consists of 10 groups of indicators that receive quantitative assessments and are summarized in one indicator - "ease of doing business". Since 2006, the countries are ranked according to the value of this indicator, as Bulgaria is ranked 62nd out of 155 countries. A curious fact is that in the study "Doing Business 2020" the country is ranked 65th, already from 190 countries. The survey usually covers the reforms that have been carried out in the countries in the previous year. For previous years - no change.

The indicators for assessing the availability of credit are presented in Table 4.

Table 4. Index on Getting credit in Bulgaria

Index	Value
Strength of legal rights index (0-12)	8
Depth of credit information index (0-8)	5
Credit registry coverage (% of adults)	78
Credit bureau coverage	0

Source: Data from the World bank

The significance of the indicators is as follows:

1. this index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. Its optimal value is 12;
2. this index measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit registry or a credit bureau. Its optimal value is 8;
3. this indicator reports the number of individuals and firms listed in a credit registry with information on their borrowing history from the past 5 years (Its optimal value is 100);
4. this indicator reports the number of individuals and firms listed by a credit bureau with information on their borrowing history from the past 5 years. (Its optimal value is 100);

As can be seen from the values, the worst indicator is 4. At an optimal value of 100, the indicator is zero, taking into account that there is currently no credit bureau. A credit register has been in place since 1998 and for about four years its information bank has been submitting data on absolutely all receivables of credit institutions, regardless of their amount, and their servicing is reported until their full repayment. The only banking products that are not subject to reporting are loans from the government and the issuing institution, overdrafts on debit cards up to BGN 1,000 and interbank loans.

However, agricultural cooperatives have no obligations only to credit institutions. The column with creditors also includes the various companies that provide consumer financing, electricity, water and heating providers, mobile and cable operators, and some large retail chains that allow for deferred payment. However, there is no summary data on their receivables. The advantages of desks are mainly two:

1. they store information on loans not only from banks and leasing institutions, but also accumulate information from representatives of various sectors of industry - mobile and telecommunications operators, utility companies, credit card issuers.

2. prepare a client profile. While the base maintained by the BNB rather represents the current state of the consumer's obligations, the private agency monitors the regularity of each installment and keeps a history of how each debt is repaid.

Regarding the third indicator - it is determined by the number of companies and individuals, as well as the total value of the two, reflecting the affordability of lending. The total percentage of the adult population for whom loans are available is 78%.

Regarding the second indicator - the grade 5 is given on the basis of: the utility companies; lack of information for at least the last two years, if there were negative data in the client's credit file and they were completely deleted; lack of credit assessments by a bureau or register as a value-added service to help banks and financial institutions assess the creditworthiness of borrowers.

Regarding the first indicator - the final assessment is reduced by: the lack of a legal framework covering the creation, publicity and imposition of collateral shares in movable assets (Does an integrated or unified legal framework for secured transactions that extends to the creation, publicity and enforcement of functional equivalents to security interests in movable assets exist in the economy?); lack of a collateral register, which is geographically unified with an electronic database; Lack of a register of collateral based on notifications in which all functional equivalents can be registered (Does a notice-based collateral registry exist in which all functional equivalents can be registered?); lack of a modern collateral register in which registrations, amendments, cancellations and searches can be made online by any interested third party (Does a modern collateral registry exist in which registrations, amendments, cancellations and searches can be performed online by any interested third party).

4. Conclusion

The hypothesis, which is emphasized at the beginning of the article, is confirmed by the following generalized conclusions:

1. For the last 5 years, regardless of the absolute increase of loans for agriculture, their total relative share has not changed. Taking into account inflation, the figures indicate an unchanged credit volume in the sector.
2. Poor access to bank loans, especially for young farmers, is due to high interest rates, lack of collateral to provide, uncertainty about future income.
3. Lack of experience and credit history also have an impact on limiting the use of banking resources;
4. Small farms can only afford to apply for working capital loans and cannot invest in modern facilities. This makes them less competitive in this sector compared to the big "players".
5. The consolidation of farms leads to market distortion.
6. The resolution (paragraph 3) emphasizes the difficulties in accessing credit for the purpose of acquiring or owning land, in particular for new entrants and young farmers; Calls on the Commission to set up appropriate instruments within the CAP and related policies to make it easier for them to start farming, ensuring them fair access to sustainable credit;
7. A positive trend is the started change in the policies of the banks, related to the introduction of preferences in granting loans.

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The View of Slovak farmers on the Climate Change

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Abstract
The agricultural sector is particularly exposed to environment in the context of climate change. Agricultural practices depend on the climate. Over the years yields in this sector vary depending on short-term climate conditions. Changes in temperature, precipitation and other phenomena caused by climate change directly affect crop yields and subsequent food production, and indirectly affect changes in water availability. Therefore, it is necessary to implement such adaptation procedures that consider the perception of this problem by farmers. The aim of this paper is to point out the views of farmers on climate change, how it affects them and how the climate change affects the future development of the CAP and its adaptation measures, as the views and experiences of farmers themselves are very important in shaping agricultural policy. We analyse these views and provide the reader with a brief overview of the basic starting points and the views of selected sample of farmers on this issue.

Keywords: *agriculture, CAP, climate change, farmers, Slovakia*

JEL Classification: *Q18, Q25, Q54, Q58*

1. Introduction

Agriculture has an irreplaceable place in the economy of each country. It affects the country not only as an area of economy that provides food production, but also values that are not the subject of production and trade, e.g. biodiversity, the cultural and aesthetic value of the landscape and a quality of environment. The role of the state should be to ensure that the only goal of agriculture is not only to produce a lot of quality food for the country's population, but that agriculture must also pay attention to land maintenance, rural development and currently much-needed environmental protection.

Agriculture has a huge impact on the environment, but at the same time the environment and climate change have a significant impact on agriculture. Agriculture is therefore directly dependent on climatic conditions.

In the last two decades, we have experienced the 18 warmest years since the beginning of the measurements and increasingly extreme weather and weather events such as forest fires, extreme heat and floods (European Council, 2021). CO2 concentrations reach the highest values since existence of mankind, which is manifested mainly by drought, desertification, loss of vegetation and loss of biodiversity, as well as rising sea levels and acidification, extreme weather, and different socio-economic impacts (Kovářová & Pokorný, 2010). Human activities, such as the burning of fossil fuels, deforestation, and agriculture, lead to emissions of carbon, methane, nitrous oxide, and hydrocarbons.

Scientific evidence suggests that the risks of irreversible and catastrophic change would increase significantly if global warming exceeded 2 ° C - or even 1.5 ° C - compared to pre-industrial levels (European Parliament, 2021).

Thus, environmental change is a global challenge that must also be addressed globally. The European Union (EU) has an important position in this regard. However, it is questionable

whether the EU is fully committed to contributing to increased expectations and to responding sufficiently to the needs of current times in relation to the climate change.

Climate forecasts assume that most of Europe will have a higher level of warming than the world average and we expect big differences in European regions (IPCC,2018). Changes in temperature and amount of precipitation, as well as weather and climate extremes in Europe, are already affecting crops and livestock. Weather and climatic conditions also affect the availability of water needed for irrigation, livestock, agricultural processing and transport and storage conditions. Changing environment can also lead to significant changes in what and where farmers in Europe can produce. Climate change is expected to reduce crops in the southern regions and improve crop conditions in the northern parts of Europe. Although longer growing seasons and more favourable conditions for agricultural production may occur in the northern regions in the future, the number of extreme events adversely affecting agriculture is also expected to increase which will have negative impact on agriculture in these regions.

The extent of the impact of climate change will depend on various factors, such as: geographical area, socio-economic development, changes in agro-ecosystems and the region's adaptability.

However, agriculture itself also has a major impact on the environment, in particular through the transfer of greenhouse gases and air and soil pollutants.

In the future, these already observed effects of climate change are expected to be exacerbated. The increase in temperature will result in an extension of the growing season and a moving of the areas suitable for growing agricultural production to the north, where climate models expect an increase in amount of precipitation (Kovats et al., 2014).

These effects on agricultural production can lead to economic and social impacts, mostly related to food security. The global human population is projected to increase by 2 billion by 2050, with the largest increases in developing countries with relatively high-income elasticity for food demand. As a result, demand for food could increase by more than 70%, assuming modest growth (Blandford & Hassapoyannes, 2018).

This increase means that we need to change the way we grow, supply, and consume food. Food production will have to increase, while considering environmental protection as well as climate change.

Agriculture therefore faces a major challenge, in particular lowering its impact on the environment and adapting to climate change while increasing its production. However, it is unrealistic to expect change in the production structure of individual agricultural entities, with reference to environmental protection, if this change does not alter the economic benefits for them, as the main goal of business is primarily to make a profit. A well-designed agricultural policy at European level therefore appears to be a very important factor.

The EU through its Common Agricultural Policy (CAP) also has a significant influence on the agricultural sector, which is changing and must change because of climate change. Therefore, the shape of the CAP is very important for the future of the agricultural sector in the context of climate change.

Over time, major reforms have taken place: in 2003, in 2009 and in 2013 for the budget period 2014-2020. The first discussions on the CAP after 2020 started in 2016 and the relevant legislative proposals were presented in June 2018 and with this another process of CAP reform started and continues to this day.

The new CAP for 2021-2027 sets adaptation in the agricultural sector as one of its main objectives. Adaptation to climate change has been elevated to a goal that needs to be addressed through strategic plans, which must be developed by Member States. The CAP influences the economic decisions of farms across the EU and affects how individual farmers decide to manage their land, what their production structure is and how they use inputs, including energy, fertilizers, and water. Many of these decisions have a major impact on the environment. Under

the proposed new implementation model, Member States will have more flexibility and subsidiarity, together with the responsibility for drawing up an individualized CAP strategic plan.

2. Data and Methods

The aim of this paper is to point out on the views of farmers on climate change, how climate change affects them and what is their opinion on the future development of the CAP and especially its adaptation measures to climate change. As the views and experiences of farmers themselves are very important in drawing up a strategic plan. We will try to analyse these views and provide a brief overview of the basic starting points and attitudes of a selected sample of farmers on these issues.

We will use the method of questionnaire and the Q-sort method, which is relatively common in the field of psychology, but less common in the agricultural economy. The foundations of this method were laid in the mid-1930s by psychologist and physicist William Stephenson. However, we can also observe this method in the field of agricultural and environmental research (Jaschke, 2017; Kato & Schoenberg, 2014; Davies & Hodge, 2012; Howard et al., 2016.). We are adapting the method to examine the perceptual frameworks regarding the impact of climate change on the environment, on farmers practices and on their views on the future shape of the CAP.

The benefit and at the same time a certain limitation of farmers' answers is the fact that their answers are socially constructed and therefore not easy to understand. They are complex and may contain several meanings at once. At the same time, farmers selectively filter their experience in a given situation from certain aspects or circumstances to which they do not consciously or unconsciously pay attention.

The chosen method represents a research approach at the interface of qualitative and quantitative methods. It allows a systematic analysis of complex opinions and subjective attitudes related to specific problems.

In order to obtain bottom-up information on how climate change affects farmers, how agriculture can adapt to climate change and how good agricultural practices can be supported by the CAP, we conducted a survey in the form of an online questionnaire[4] and in some cases a follow-up structured interview with various Slovak farmers in the Nitra region.

In the survey, respondents were confronted with questions and various statements about climate change and the future concept of the CAP. Some questions could be answered freely, for others it was enough to indicate one answer that applies to them, and other statements had to be classified according to a predefined classification process. The way respondents classify and combine statements reveals information about their subjective views on how the CAP should be designed in the future.

We paid special attention to the same wording of the questions, not only in the initial questionnaire, but also in the subsequent interview. Respondents were not provided with any assistance other than the standard explanation of the question in order to avoid possibly influencing the respondents' answers. The survey was conducted from April to May 2021 and involved 3 agricultural entities in the Nitra region.

As for the respondents, all farmers differ to some extent in the size of their business, the type of production, the length of operation in the agricultural sector and the location in the Nitra region.

In the analysis, we focused on how farmers describe their experience with climate change. We were interested in what topics they bring and how they connect them. We were mainly

[4] questionnaire on request from the author

interested with the process of examining the statements of farmers affected by climate change and about their understanding of the world in context of climate change.

We used Kaufmann's work, which contains various tips and recommendations on how to work with interviews, comments, and answers from respondents (Kaufmann, J., 2010). We have tried to focus on the repetitive statements that he considers to be the most important, although they are the most common and widespread. We also looked for inconsistencies in the respondents' statements that would offer us a key to interpretation and help to better identify some important analytical aspects of the issue.

We compared the answers of all respondents and found several penetrations, differences, and similarities. The description of these answers created a comprehensive picture of the respondents' experiences with climate change and their view on the future shape of the CAP regarding adaptation to climate change.

3. Results and Discussion

As far as climate change is concerned, everyone from our responders considers climate change to be in some way a natural process on which humankind has a major influence on. In our research, farmers clearly and unequivocally criticize our society and its activity, which they consider to be an activity that contributes to the deterioration / change of climate conditions. They express their belief that climate change is man-made.

Our respondents agree with the criticism that agricultural activity is considered a cause of climate change. Although they are aware of the impact of agriculture on the environment, they do not consider agriculture to be a major cause of climate change.

All respondents agreed on one main aspect, which they attribute to climate change: they see it as fluctuations or extremes of weather, which have intensified in recent years and are manifested, for example, by drought and uneven amount of precipitation, which they see as the biggest problem.

During their years in this sector, respondents identified few extreme climatic events, e.g., drought, windstorms, hail, extreme rainfall, floods. Respondents most often encounter drought, severe storms, and hail when it comes to weather fluctuations.

In the context of the uncertainty that climate change brings, there is also the question of how quickly these effects of climate change will occur. The answers suggest that for the respondents the change of environment is unpredictable. Nevertheless, several respondents express some belief that circumstances will improve in the future.

All respondents believe that if they will focus their activities on greener, more environmentally friendly agriculture, it will be beneficial for protecting the environment and halting climate change, but they lack experience and funding.

Respondents usually talk about climate change as the conditions or quality of the soil in their locality - that is, about the immediate effects of the environment, which they encounter in their activities. Respondents often compare current conditions with the past. Their interpretation of the change of conditions is therefore based on local and personal experience.

All respondents in some way express fears of future heat and drought, or other implications of climate change. The growing drought is perceived among farmers as a relatively recent change.

In their answers, farmers also mention the specific problems they have with regard to changes in the weather or in the country in general. They most often talk about rising temperatures and drought as triggers for their problems. They identify these problems as, for example: more weeds, pests, snails, invasive species, insufficient vegetable yields, lack of water. They also identify extreme weather fluctuations such as floods and hail as very risky.

Although personal experience is a fundamental factor from which respondents derive the information of climate change, several said that they also obtained information by studying other sources - media, scholarly articles, studies, books, interviews and statistics.

From the answers we can also identify that the larger the land the farmers manage, the less risk they feel, as they have different productions, the risk resulting from the "failure" of one crop can be spread between different crops. Smaller farmers perceive climate change and the associated uncertainty much more intensely.

All respondents agree that if they want to succeed, they must, in addition to hard work, seek understanding from official institutions and bureaucracy, which they expressed, should help them and not put logs under their feet.

In their answers we could often see frustration with the subsidy administration. Problems with administration, bureaucracy and corruption are commonly associated with farming in Slovakia. However, small farms are much more affected by these problems than larger farms, which tend to have greater opportunities and resources to cope with administration, bureaucracy and sometimes even with corruption.

In the next part of the questions, we focused on the CAP and the view of farmers on its current form, effectiveness, efficiency and also the form of this important policy in the future, especially in relation to climate change and adaptation measures. On the future shape of the CAP many ideas have been proposed, and many shortcomings of a different nature have been highlighted, such as:

- promoting greater crop diversity and biodiversity,
- better information,
- less bureaucracy,
- more balanced payments to farmers across European countries,
- additional financial support for farmers who are willing to take "extra steps" in relation to environmental protection,
- support for rainwater retention,
- ensuring the proper application of the "greening" measures,
- support for soil regeneration,
- ban the use of chemical fertilizers on soil,
- support for more integrated agriculture,
- creation of two groups of farmers (large farmers and small farmers), both groups will follow different rules and will receive differently targeted support at different levels,
- support consumer awareness,
- promote efficient use of water.

Regardless of how respondents perceive the role of the CAP in adaptation to climate change in agriculture, they have many suggestions for improving the role of the CAP in supporting adaptation measures to climate change in agriculture.

In a some form the EU already tried to implement several suggestions expressed by our respondents into the new form of the CAP e.g., the suggestion that different rules and incentives can be applied to different groups of farmers, which may reflect a strategic aspect of agricultural policy, especially at regional level, or additional financial support for farmers who want to take "extra" steps in relation to environmental protection. However, it is questionable whether these proposals will have the desired effect after implementation.

4. Conclusion

Our survey showed that all respondents perceive that some form of climate change is taking place and have experienced extreme climatic events (some less, some more), all believing that governments, agricultural institutions, and farmers themselves have an important role to play in selecting and implementation of adaptation procedures to these changes.

The contribution of this work in the researched area is considerable. The core of the work was to describe the relationship between climate change and agriculture and to point out the perception of this issue by Slovak farmers.

In their responses, respondents emphasize the anthropogenic origins of climate change and criticize society for its unsustainable treatment of the landscape. Some also want a more radical reform. Everyone is aware of the global nature of this change and anticipates that the climate will continue to change. This can be deduced from the fact that they have personal experience with the damage caused by this change, for example they all have experience with extreme climatic events. The pace of change and the associated uncertainty and unpredictability also bring them worries about the near future.

Personal experience is the most important source of their perception of climate change. Many are able to point out exact year in which they observed the first significant effects of climate change - in the form of pest multiplication, insufficient growth or drought, or a slowdown in production.

It is also clear from the research that climate change is a greater problem for farmers with smaller socio-economic background. Lack of funds on a smaller farm, combined with the consequences of climate change, can lead to almost helplessness and an existential problem.

In our research, we also sought to find out how farmers respond to climate change. Respondents approach adaptation usually where it concerns them, they do not do adaptation measures before they really need them.

The answers reflected the respondents' efforts to continue working in the field of agriculture, despite various obstacles associated with it. They are also aware of the negative impact of conventional agriculture on the environment and the need to address this situation, also with regard to climate change and adaptation measures. They claim that it is difficult for them to make certain changes when they have significant problems with regulations, corruption, or the administration of subsidies.

Regarding the CAP, farmers identify shortcomings in particular in the excessive bureaucracy and restrictions on business freedom caused by greater regulation and in the fact that the CAP is not aimed at those who need it most - small and family farmers and local producers. Respondents also identify several suggestions for improving the role of the CAP in adaptation measures to climate change in agriculture.

If we are to evaluate the proposed form of the CAP, we are of the opinion that the European Commission is proposing a flexible system aimed at simplifying and modernizing the CAP. It is questionable to what extent it will succeed in realizing these intentions. Member States are given a more important role, as they need to draw up national strategic plans setting out how they intend to meet European objectives through CAP instruments while responding to the specific needs of their farmers.

The proposed form of the CAP therefore introduces comprehensive strategic planning at Member State level as one of the key new elements of the future CAP. In our opinion, this model is a step in the right direction, even though its application will be quite demanding. As the policy is more adapted to local conditions, there will also be a better acceptance of this policy by society, as it should reflect the specific problems and conditions in the territory. The key question should therefore be how the proposed strategic plans will be implemented in the real world and whether they will deliver a more effective policy.

In our opinion, the presented results represent a certain starting point for practical use in the creation of future policies in the field of the agricultural sector in the times of climate change.

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Financial Literacy and Stock Market Participation in Indonesia

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Abstract

Financial literacy is critical for the future well-being of individuals. Understanding the basic concept of finance enables people to make sound financial decisions and gain a better knowledge of investment. The study measures financial literacy and its impact on stock market participation using the big three questions of interest compounding, inflation, and risk diversification. An empirical survey was conducted on 215 respondents in Indonesia. The data was collected through an online questionnaire from June 14 to September 30, 2021. The binary logistic regression was applied to analyze the data. The empirical result confirms that fewer than half of respondents answer financial literacy questions correctly. The proportion of correct answers for compound interest is 47%, followed by risk diversification and inflation at 37% and 34%. Furthermore, employment status, compound interest, and inflation significantly impact stock market participation. However, gender, marital status, and risk diversification were insignificantly related to stock market participation in Indonesia. The research contributes to policymakers in understanding the determinant of stock market participation in Indonesia.

Keywords: *financial literacy, stock market participation, Indonesia*

JEL Classification: *D8, G11, G53*

1. Introduction

The understanding of basic financial concepts plays a pivotal role in the individual's future welfare. Financial literacy skills benefit selecting financial assets based on the potential risk and return during the normal economic situation. Meanwhile, financial literacy understanding assists in risk diversification during times of crisis. Someone with a higher level of financial literacy typically experiences lower negative impacts of the crisis than financial illiterate people (Klapper et al., 2013). According to the (OECD, 2020), financial literacy is a combination of the awareness, knowledge, ability, attitude, and conduct essential to make sound financial decisions and ultimately attain individual financial well-being.

Financial literacy skills are becoming increasingly important, particularly in the era of the Covid-19 outbreak. The demand and supply shock due to restrictions on economic activity to mitigate the spread of Covid-19 can reduce people's welfare. Therefore, individuals with sound financial knowledge can make the appropriate financial management strategy and decision. According to (Lusardi et al., 2017), financial literacy variables that help the future of wealth accumulation include knowledge of numeration, compound interest, inflation, and risk diversification.

Researchers have investigated the impact of financial literacy on financial behavior throughout the last few years. (Bernheim, 1998) was among the first to emphasize the need of financial literacy in explaining financial decision-making. Following that, considerable literature has emphasized the importance of financial literacy in financial decision-making, such as retirement planning. Currently, many studies evaluate the relationship between financial literacy and financial market participation. As part of the 2004 Health and Retirement Study (HRS), (Maarten Van Rooij et al., 2011) developed a module to assess financial literacy (HRS). They examined financial literacy among older adults in the United States and discovered significant gaps in fundamental financial understanding. Additionally, the study discovered a significant positive correlation between financial literacy and retirement planning, as well as a beneficial effect of formal education on financial literacy.

Furthermore, (M van Rooij, 2011) discovered a favorable association between stock investment decisions and certain measures of financial literacy and cognitive ability. They came to the conclusion that financial literacy influences financial decision-making. Individuals with low literacy levels are less likely to invest in the stock market. (Frijns et al., 2014) showed that persons with more financial expertise tend to gain further financial literacy through financial education programs and self-education. Despite the need of financial literacy from a young age, various researches have investigated the financial literacy of today's youth. Based on data from nationwide longitudinal surveys, another study discovered that young people aged 23 to 28 have a low degree of financial literacy (Lusardi et al., 2010). A recent study conducted by (Thomas, 2018) and (Arrondel, 2010) found a significantly positive association between financial literacy and stock market participation. In general, the findings of these studies conclude that financial literacy has a positive influence on stock investments. Unfortunately, most financial literacy studies are conducted in the developed countries.

Indonesia is an exciting setting for our research since the country has the number of youth (according to Indonesia Law Number 40 of 2009 is an Indonesia citizen aged 16 to 30 years) is 64.50 million people or almost a quarter of the total Indonesian population (23.86 percent) which is a crucial period of age growth and development. Indonesia also has a comprehensive financial system that is interconnected with international financial markets, with the key financial services industries including banking, insurance, and stock markets. Furthermore, the proliferation of technology and the availability of various financial products have implications for finance in the future.

As financial literacy and stock market participation studies in Indonesia are scarce, and the necessity to find the determinant factor to promote financial service participation among Indonesian people becomes crucial, this paper presents descriptive results of financial literacy knowledge in Indonesia, integrating with stock market participation. The survey was conducted online on 350 respondents from 15 to 60 years old. A questionnaire was distributed to Indonesian participants to collect demographic characteristics, financial literacy, and stock market participation. The next section of this paper is outlined as follows. Section 2 contains the data and research methodology, Section 3 presents the results followed by a discussion, and Section 4 provides conclusion.

2. Data and Methods

The data set in this study was obtained from the questionnaire over the period June 14 to September 30, 2021. The survey was conducted online on 350 respondents from 15 to 60 years old. A questionnaire was circulated to Indonesian participants in order to obtain data on demographics, financial literacy, and stock market participation. The data for this study is gathered using the snowball sampling approach. After excluding respondents who did not reply

to empirical analysis questions, such as stock market participation, a sample of 215 respondents was selected for analysis.

Financial literacy is assessed in this study with three questions that measure fundamental financial concepts such as compound interest, inflation, and risk diversification (Lusardi & Mitchell, 2014). Question 1 (compound interest): Assume you deposit Rp.1.000.000 in a savings account earning 2% per year. After five years, how much money would be in the account? (1) Greater than Rp.1.020.000 (2) Equal to Rp.1.020.000 (3) Less than Rp.1.020.000 (4) I'm not sure. Consider the following scenario (inflation): Assume the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much can you purchase with the money in this account? (1) More than now. (2) Equal (3) Less than today. (4) Unknown. True or untrue regarding question 3 (risk diversification)? "Investing in a single company's stock typically provides a more secure return than investing in a stock mutual fund." (1) True. (2) Untrue. (3) Unknown. Furthermore, stock market participation is quantified regardless of whether the respondent participates in the stock market (Sivaramakrishnan, 2017).

Table 1. Data description and criteria in this study

Variables	Details	Criteria
Y	Stock market participation	0 = not invest
		1 = invest
X1	Gender	0 = female
		1 = male
X2	Employment status	0 = unemployment
		1 = employment
X3	Marital status	0 = single
		1 = married
X4	Compound interest	0 = incorrect
		1 = correct
X5	Inflation	0 = incorrect
		1 = correct
X6	Risk diversification	0 = incorrect
		1 = correct

Source: author's classification

The study applies a binary logistic regression model to estimate the determinant of stock market participation. The model can be formulated in the equation below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e \quad (1)$$

Binary logistic regression is helpful to predict a categorical variable, particularly in is used for the dichotomous variable Leech et al. (2015).

3. Results and Discussion

Table 2 shows the statistic descriptive of 215 respondents for each variable. The mean score is higher than 0.50 indicating that the male participant is higher than the female respondent. The respondent with marital status is only 14 out of 215 respondents. For the financial literacy measurement, the compound interest has higher mean (0.47), followed by the risk diversification and inflation at 0.37 and 0.34. The number of respondents participate in the stock market in Indonesia is much 76 people, with a mean score at 0.31.

Table 2. Descriptive statistic of sample respondents

Variable	Obs.	Mean	Min.	Max.	Std. Dev.
Stock market participation	215	0.31	0	1	0.464
Gender	215	0.53	0	1	0.501
Employment status	215	0.37	0	1	0.483
Marital status	215	0.07	0	1	0.247
Compound interest	215	0.47	0	1	0.501
Inflation	215	0.34	0	1	0.476
Risk diversification	215	0.37	0	1	0.483

Note: stock market participation means the person holding equities in Indonesian companies

Response to the financial literacy questions is presented in Table 3. Panel A shows that less than half of respondents answer all basic finance questions correctly. The correct answer for compound interest has the highest score at 47%. However, the correct answers decrease considerably to risk diversification and inflation at 37% and 34%, respectively.

Table 3. Correct and incorrect answers of financial literacy

Panel A: Weighted percentages of correct and incorrect answers (N=215)

Variable	Compound interest	Inflation	Risk diversification
Correct	47%	34%	37%
Incorrect	53%	66%	63%
Total	100%	100%	100%

Panel B: Weighted number of correct and incorrect answers (N=215)

	None	1	2	3	All
Correct	96	35	32	52	215
% Correct	45%	16%	15%	24%	100%

Source: author's calculation

Panel B displays many respondents failed to answer the basic financial literacy concepts. 96 out of 215 respondents answered the three questions incorrectly, compared to 52 respondents with all correct answers.

The estimated determinant of stock market participation in Indonesia using binary logistic regression is presented in Table 4. Gujarati (2004) explains that binary logistic analysis does not necessarily conduct classical assumption tests, such as multicollinearity and

heteroskedasticity tests. In addition, the Nagelkerke R-squared result revealed that the independent variable explains 36.2% of the variation in the dependent variable.

The binary logistic regression results are presented in Table 3 under two different specifications including general information of respondents, namely gender, employment, and marital status. Another classification covers financial literacy variables, such as interest compounding, inflation, and risk diversification.

Table 4. Determinants of stock market participation

Variable	B	Std. Error	Wald	Sig	Exp(B)
X1	-.280	.360	.608	.435 [ns]	.755
X2	1.078	.379	8.068	.005 [(*)]	2.938
X3	-.859	.794	1.171	.279 [ns]	.424
X4	3.247	.532	37.225	.000 [(*)]	25.701
X5	-1.922	.523	13.531	.000 [(*)]	.146
X6	-.419	.462	.821	.365 [ns]	.658
Nagelkerke R-squared		0.362			

[ns] = not significant, [(*)] = significant at the 5% level

The estimation result in Table 3 reveals that employment status, compound interest, and inflation are each separately significantly at the 5% statistical levels. However, gender, marital status, and risk diversification were insignificantly related to stock market participation in Indonesia. The coefficient Exp(B) measures the impact of an independent variable on a dependent variable.

The respondents with employment status were 0.755 times more likely to invest in the stock market. The previous study shows that people with regular income tend to manage finances better, including allocating investments in stocks and anticipating the increase of health expenses. Individuals with stable income are relatively easy to decide the amount of regular consumption and investment (Girshina et al., 2019).

The compound interest has a significant effect on stock market participation in Indonesia. This finding indicates that interest compounding knowledge is either increases or decreases the likelihood of stock market participation. The individual's ability to do interest rate calculation is better in preparing a saving plan and financial expense in the future. Financial planning is crucial to retirement preparation. (Lusardi & Mitchelli, 2007) found that people who have retirement plans have two or three times more money than those who do not have financial planning. In addition, the stock market participation in Indonesia is also associated with knowledge of inflation. Inflation is an important variable to determine purchasing power, but this study found that only a few respondents could answer questions about inflation correctly.

Gender insignificantly affects the stock market participation. This result suggests that there is little difference in stock market participation between male and female. This finding seems different from previous studies, revealing that female is less likely to have access to financial products than male. However, this finding indicates that both male and female have the same access to stock market participation.

This paper reveals that marital status has no significant impact on stock market participation. Logically, married couples will have better money management since they need to prepare for their future family expenses. (Guiso et al., 2005) find women increase the amount of investment in stock after married. In addition, this study also finds that male and female marriages increase the likelihood of holding financial assets (Christiansen et al., 2012).

The risk diversification skill is usually associated with participation in the financial market since it helps them mitigate risk during an investment by allocating capital into several different financial assets. However, this study finds difference that risk diversification does not impact stock market participation for Indonesian respondents.

4. Conclusion

This study is focused on stock market participation in Indonesia. Stock market activities in this country have developed rapidly and benefit both corporations to gain capital and investor as a place to invest the money. To evaluate the stock market participation, three big questions of financial literacy such as compound interest, inflation, and risk diversification are identified based on the literature review and evaluated from the data collected through an online questionnaire in Indonesia.

The study finds that less than half of the respondents answered the financial literacy questions correctly. For example, 47% of respondents answered the compound interest question correctly, followed by risk diversification and inflation at the level of 37% and 34%. The lack of financial literacy harms the individual future finance. The policymakers can improve the financial literacy for all people in Indonesia by providing financial basis education from a young age through schools and universities. This initiative will positively impact, especially to anticipate the increase of life expectancy and require people to ensure adequate future expense. It also benefits people to have sound financial knowledge to make a financial decision.

The findings of this paper indicate varying determinants of stock market participation in Indonesia. Indonesian people view employment status, interest compounding, and inflation as significantly impacting stock market participation. The stable income drive people to have more opportunity to manage their money, including participating in the financial sector. In contrast, gender, married and non-married, risk diversification does not significantly impact individual participation in the stock market. Thus, providing financial literacy education program is essential to the promotion of stock market participation in Indonesia.

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Comparison of the Viticulture and Viniculture Sector in the Conditions of the Slovak Republic and Hungary

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Abstract

The current trend in the field of viticulture is the renewal and revitalization of neglected vineyards by new planting of bred varieties of vineyards, but also the preservation of old roots. Slovakia and Hungary have rare and high-quality wine-growing areas and producers who produce high-quality products. The main goal of the research was to compare the viticulture and viniculture sectors of the Slovak Republic and Hungary. Comparison of wine-growing areas of countries and one common wine-growing area, their area, production, and some wines. The research was carried out based on processing available statistical data and databases of selected countries and evaluated both numerically and statistically using basic indices and differences in individual basic and current years, the observed period is from 2010 to 2019. Hungary (68,418ha) has about six times more vineyard exchangers than Slovakia (10,927ha), which causes an exact difference between the two, but both countries show a decrease in vineyard exchanges every year. The paradox, however, is that they continue to reduce the area of vineyards production in both countries, support the rising character and result in the planting of new species of vineyards, Slovakia (43,044t), Hungary (457,239t). Within the same wine consumption in Hungary (205,400,000l) and Slovakia (66,547,000l), the research showed a declining trend in both cases, even though Hungary exceeds the Slovak wine supply in wine consumption. However, the research showed higher consumption of wine per capita in Hungary (21.02l) than in Slovakia (12.2l). In Hungary, the average population of consumers consumes 1.72 multiple more wines per year than the Slovak population.

Keywords: *wine, comparison, wine production, wine consumption,*

JEL Classification: *Q00, Q02, Q10, Q13*

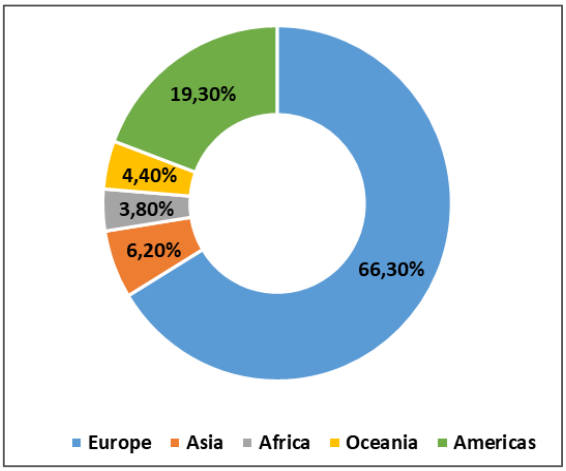
1. Introduction

Viticulture and winemaking in Slovakia and Hungary have a long tradition and are close not only because they are neighbouring countries but also because they have a common history and also share one of the same and very important wine-growing areas. The main goal of the research was to compare the conditions of vineyard cultivation, grape production, wine and wine consumption in the conditions of the Slovak Republic and Hungary in comparison with the wine-growing areas and the common wine-growing area of the Slovak Republic and Hungary.

Central European countries are characterized by the fact that it is the wine-growing regions that have it in their culture, cuisine and their national pride and history include grape growing and wine production for many centuries (Bojnec, 2006). During the beginnings of wine growing, the Celts and then the Romans became famous, who continued their winemaking processes, where the wine industry later developed with a regional distinction in production processes. Wine production and its control have a long tradition in the development of wine regions, wine brands, and grape varieties themselves. The development of wine destinations

consists mainly of tourist associations, which are associated with wine regions, food, and traditions (Aaker, 1996). Wine not only has a historical and cultural tradition but also has its significance in the medical concept. According to studies, drinking wine affects a person's circulatory, digestive and nervous systems, reduces depression, stress and contains several beneficial vitamins (Popescu & Pîrvutoiu, 2013). According to available statistics, in terms of production, wine for the years 1993-2018 ranked 9th in the world with 27,314,142.38 tons. Among the commodities that occupied the first places are mainly beer, barley, sugar, molasses, cottonseed, oil palm, and soybean oil. However, if we take it from a global scale, the production of wine will focus mainly on the European continent, which placed first in the rankings that we can see Fig. 1 with 18,121 392.85 tons, representing 66.3% of the global total. America came in second with 5,261,982.65 tons, representing only 19.3%. Other continents such as Asia (1,699,873.35 tonnes), Oceania (1,196,677.96 tonnes), and Africa (1,034,215.69 tonnes) accounted for less than 10% of the world. (Chiurciu at all, 2021).

Figure 1. Distribution of wine production worldwide (%)



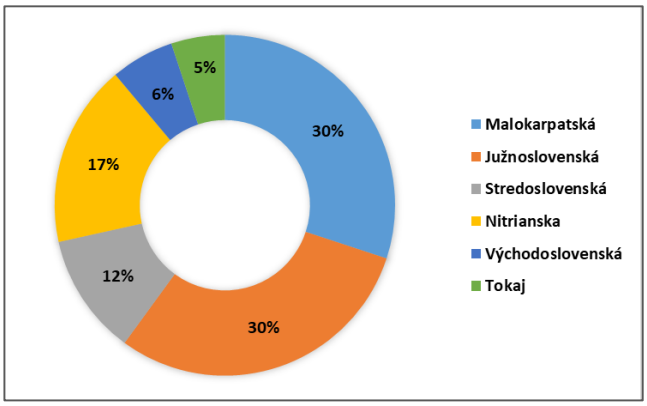
Source: Own processing based on Chiurciu at all (2021).

For the period 1993-2018, France was among the top 5 producers with a production of 5,053 831.19 tonnes, Italy with a production of 4,946,011.23 tonnes, Spain with a production of 3,493,831.19 tonnes, representing the countries of the European Union and, last but not least, the last two places were the United States of America with a production of 2,486,006.81 tons and Argentina with a production of 1,417,152.92 tons (Faostat, 2021).

1.1. Slovak wine-growing regions

There are six wine-growing areas in Slovakia, which we can see in Fig. 2. The Malokarpatska region has the largest hectare representation, up to 5,259.3 hectares. The second-largest area is the Južnoslovenská region with 5,345.6 hectares and the difference between them is only 13.7 hectares and makes up 60% of the total area. The third area is the Nitra region with a share of 17% of the total area, which represents 3,093 hectares. The fourth is the Strednoslovenská region with an area of 2,052 hectares. The last two smallest areas are the Východoslovenská region and the Tokaj wine-growing region, both areas cover only 5% and 6% of the total area. The East Slovak region has 1,074.1 hectares and Tokaj only a small 908 hectares, but with the great popularity of these wines. (Zväz vinohradníkov a vinárov Slovenska, 2020).

Figure 2. Slovak wine-growing regions

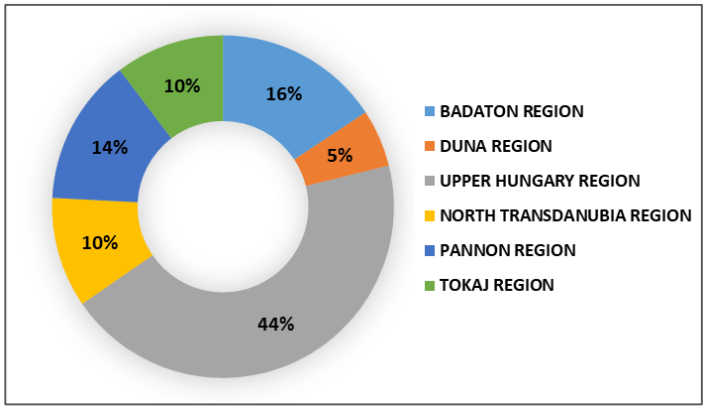


Source: Own processing based on Zväz vinárov a vinohradníkov Slovenska (2021)

1.2. Hungarian wine-growing regions

There are six wine-growing areas in Hungary, resp. of regions Fig. 3. which are further divided into several parts. The Upper Hungary region has the largest representation, up to 44%, which represents 24,576 hectares. within this region, there are areas such as Bükk, Eger, and Mátra. Other wine-growing areas already have a smaller total area. The second area with 16% representation is the Badaton Region with 8,736 hectares. In this region are the areas of Badacsony, Balatonboglár, Balato-felvidék, Balaton-scopak, Nagy-somlói and Zalai. Another region is the Pannon region with 14% representation, which represents 7,708 hectares, and in the region, there are areas of Pécs, Szekszárd, Tolna, and Villány. With a 10% share, the North Transdanubia region is 5,788 hectares and includes areas such as Etyek-Budai, Mór, Sopron, Neszmély, and Pannonhalma. The Tokaj region with 5,723 hectares was placed in almost equal representation. And as the last and smallest wine-growing region is the Duna Region with 5% representation and 3,010.37 hectares within which there are areas such as Csongrád, Hajós-Baja, and Kunság (Hungarian wines, 2021)

Figure 3. Hungarian wine-growing regions



Sources: Own processing based on Hungarian wines (2021)

The global impact of Covid-19 on the wine sector

According to the study, up to 80% of international wine producers were negatively affected by changes in sales volumes, which were mainly related to the arrival of the Covid-19 pandemic. During the pandemic, wine producers increased sales mainly through online channels, which represented a very low starting level for most wineries. Thus, Internet sales failed to offset losses from previously priority sales channels such as gastronomy, exports, and tourism (Loose & Nelgen, 2021). Another problem was quota in retail food stores, where large producers, such

as cooperatives or fillers, could compensate for their losses. Approximately 70% of small and medium-sized wineries, mainly dependent on tourism and gastronomy, have experienced a deterioration in the economic situation as a result of the Covid-19 pandemic. (Loose at all, 2021).

2. Data and Methods

Comparison method - we used the method to collect information from available professional domestic and foreign literature and professional articles.
Observation method - we used it to observe data in the wine sector from the available statistics and databases of selected countries.
Basic indices - as a statistical method we used to evaluate the current situation and the wine and vineyard sector in the Slovak market. We analyzed data from 2010 to 2019, when we considered 2010 to be a base year. Using Excel, we created tables, where we used relation (1) to calculate the index for each year:

$$I_{B(t)} = Q_t / Q_0 \quad (1)$$

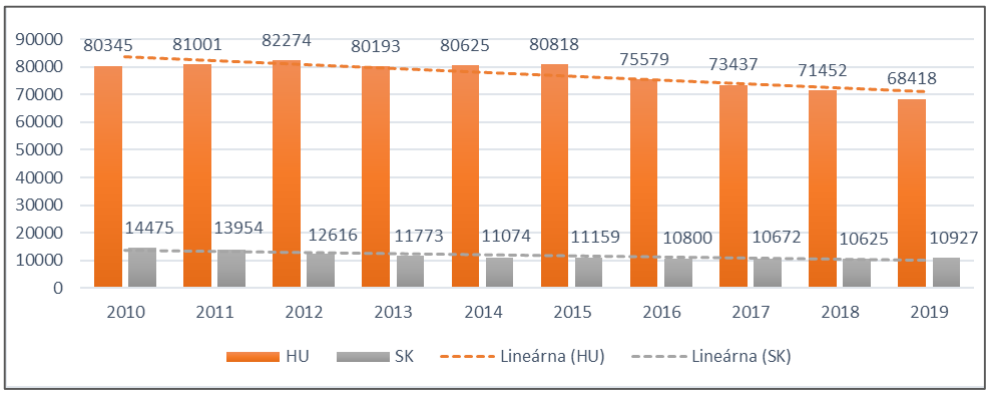
Where:
$I_{B\,(t)}$ - basic index of the selected current period
Q_t - the value of the current period
Q_0 - the value of the base period

3. Results and Discussion

3.1. Total areas of vineyards in Slovakia and Hungary

In Fig. 4. we analyzed the total area of vineyards in hectares for the years 2010 to 2019 of Slovakia and Hungary. For us, 2010 was a basic and starting year for both countries. In Slovakia, we found the highest total area of vineyards, namely 14,475 hectares, and, conversely, the lowest area in 2018, namely 10,625 ha, which represents a decrease in the total area of 3,850 hectares. In 2019, the area of vineyards increased by compared to 2018, but not significantly. We compared the year 2010 and the last year 2019 when we found that the total area was 10,927 hectares, compared to 2010, decreased by 24.51%, which is 3.548 hectares. The average total area of vineyards for the entire monitored period was 11,807.5 hectares and the trend line indicates a constantly declining trend. Within Hungary, acreage is on a different level in the base year 2010, the initial acreage of vineyards was 80,345 hectares, while in 2019 a decrease was recorded and the total acreage was 68,418 hectares, which represented a decrease of 14% in 11,927 hectares. The final year 2019 also represents the year with the lowest area of vineyards in Hungary. On the contrary, the highest area of vineyards was recorded in 2012 with an area of 82,274 hectares. The average area for the observed period was 77,414.2 hectares and the linear function also indicates a declining trend. In terms of comparison, we can conclude that Hungary has significantly larger areas of vineyards. In the base year 2010, the difference between Slovakia and Hungary was up to 65,870 hectares, while in 2019 the difference was 57,491 hectares. In terms of the total area of Slovakia (4,903,500 hectares), the total area of vineyards in 2010 was only 0.30%, in contrast to the total area of Hungary (9,303,000 hectares), the area of vineyards was 0.86%, of which we can conclude that Hungary used 0.56% larger area for vineyards. In 2019, these wine-growing areas decreased rapidly in terms of the total areas of both countries, while in 2019 Slovakia used only 0.22% of the total land area for wine-growing purposes, Hungary was 0.52% better or 0,74% of the total land area. Thus, Hungary reduced the area under vines by 0.13% during this period, while Slovakia decreased by only 0.07%.

Figure 4. The total area of vineyards in Slovakia and Hungary in hectares

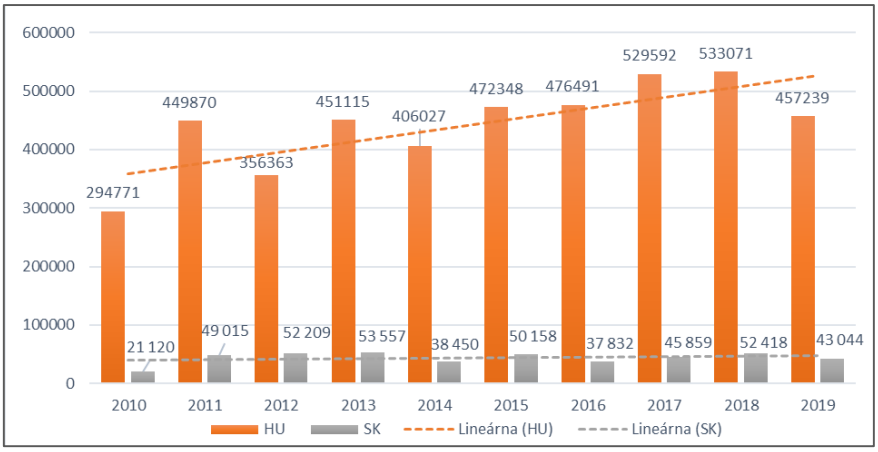


Sources: Own processing based on Hungarian central statistical office (2021) and Výskumný ústav ekonomiky, poľnohospodárstva a potravinárstva Slovenskej republiky (2021)

3.2. Total grape production in Slovakia and Hungary

The total production of nascent vineyards peaked in 2013 at 53,557 tons, while the lowest production was recorded in 2010 at only 21,120 tons, which indicates an increase in production of 153.58% over 3 years. We compared production in 2010 and 2019 when we also recorded an increase in production by 21,924 tons, which was expressed by a basic index of increase of up to 2.03 multiple more in 2019. However, in the long run, we can say that production in Slovakia is increasing linearly. In the case of Hungary, we recorded a linear increase in grape production over the period under review, where we can say that in 2018 the highest production was recorded, up to 533,071 tons. We recorded the lowest production in 2010, which is a basic period for us. The year 2019 was a year when production decreased by 75,832 tons compared to 2018. The average production for the observed period was 442,688 tons and in comparison with 2010 and 2019, the production increased by 55.11%, which represents 162,468 tons. The paradox, however, is that production is increasing even though the area is constantly decreasing, which results in particular progress in the breeding of varieties that have higher fertility than the old varieties of vineyards.

Figure 5. Total grape production in Slovakia and Hungary in tones

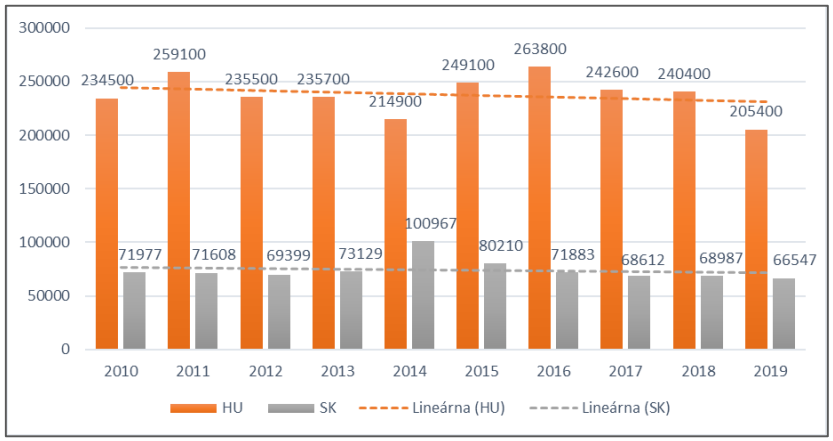


Sources: Own processing based on Hungarian central statistical office (2021) and Výskumný ústav ekonomiky, poľnohospodárstva a potravinárstva Slovenskej republiky (2021)

3.3. Wine consumption in Slovakia and Hungary

In Fig. 6 we analyze the annual consumption of wine in thous. liters in Slovakia and Hungary. In Slovakia, the highest annual consumption was recorded in 2014 when it reached the level of 100,967,000 liters and, conversely, the lowest consumption in 2019 reached the level of 66,547,000 liters, the difference between these consumptions was a decrease of 34,420,000 liters. We compared the base year 2010 with the annual consumption compared to 2014 when the consumption increased by 40.27%, which represents 28,990,000 liters of wine. On the contrary, in comparison with 2010 and 2019, a decrease of 7.54% was recorded, which represented a decrease in consumption by 5,430,000 liters of wine. Within Hungary, the highest consumption was recorded in 2016, namely 263,800,000 liters of wine, while the last year 2019 was marked by the lowest wine consumption, namely only 205,400,000 liters of wine. If we compare the year 2010 with the year 2019, our consumption decreased by 12.40%, which represents 29,100,000 liters of wine. In the long run, however, wine consumption in Hungary is declining and the average consumption is 238,100,000 liters of wine. If we compare the percentage reduction in wine consumption in both countries over the period. In Hungary, the decrease was 4.86% larger than in Slovakia.

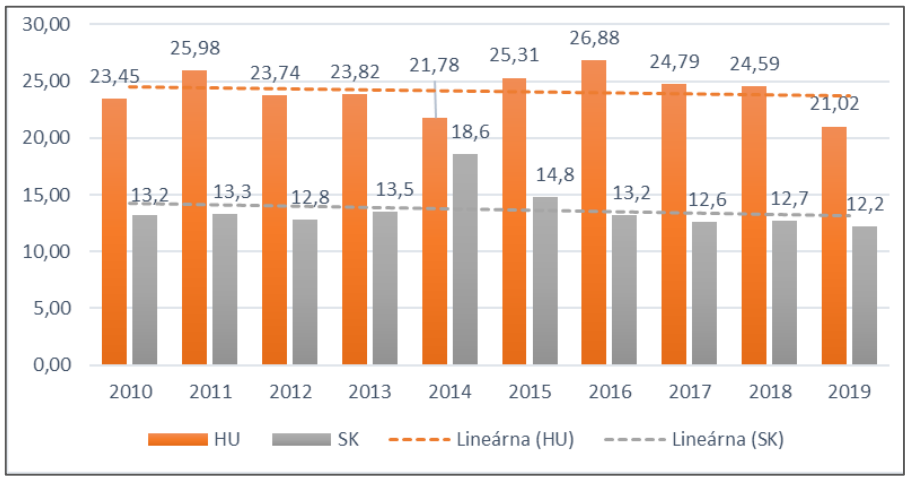
Figure 6. Annual wine consumption in Slovakia and Hungary in thous. liters



Sources: Own processing based on Statista (2021) and Výskumný ústav ekonomiky, poľnohospodárstva a potravinárstva Slovenskej republiky (2021)

In Fig. 7. we analyzed the annual consumption of wine per capita in Slovakia and Hungary. The highest consumption of wine per capita was also recorded in 2014 and reached the value of 18.6 liters and the lowest consumption was also in 2019 with the value of 12.2 liters. We compared these two critical values with the base year 2010, when we found that in 2010 consumption was 13.2 liters, and compared to 2019, we recorded a significant increase in consumption, up to 40,90%, which represents 5.4 liters of wine. On the contrary, compared to 2010 and 2019, we recorded a decrease of 7.57%, which represented a reduction in wine consumption per capita by 1 liter. Within Hungarians, consumption per capita is also much higher. The highest consumption per capita was measured in 2016, up to 26.88 liters per year per capita, while the lowest consumption in the final year was 2019, 21.02 liters per capita. The overall trend is declining and during the period under review, consumption decreased by 10.35%, which represents 2.43 liters per capita. If we take into account the average wine consumption per capita, then for Slovakia it is 13.69 liters and the Hungarian population consumes an average of 24.13 liters. If we compare these two countries, the Hungarians have 10.44 liters more consumption than the Slovaks.

Figure 7. Annual wine consumption per capita in Slovakia and Hungary in liters



Sources: Own processing based on Statista (2021) and Výskumný ústav ekonomiky, poľnohospodárstva a potravinárstva Slovenskej republiky (2021)

4. Conclusion

Viticulture and winemaking have a long tradition in the world, especially in Europe. In the research, we found that viticulture and viticulture thrive mainly on the European continent, and among the top world, producers are countries such as France, Italy, and Spain. In the study of Viticulture and Enology in Slovakia and Hungary, we found that Hungary (68,418ha) has six times larger wine-growing areas than Slovakia (10,927ha). However, a significant difference in the wine-growing areas can be expressed as a percentage of the total land area. In the case of Slovakia, only 0.22% of the total land area is used in 2019, and the case of Hungary 0.74% of the total land area. However, our research indicated that in the observed period 2010-2019 Hungary reduced its areas by 14.88% and in the case of Slovakia it went 24.51%. Despite the paradox with the reduction of wine-growing areas, production is increasing in Hungary (457,239t), Slovakia (43,044t), which results in the planting of newly bred species of vineyards with higher fertility. The total consumption of wine also varies considerably, Slovakia has recorded a decrease in wine consumption by 7.57% since 2010, which in the final year 2019 represents only 66,547,000 liters of wine. Hungary also recorded a decline in total consumption by up to 10.35%, which represents the consumption of only 205,400,000 liters of wine in the final year. As part of the annual consumption of wine per capita, we found that a Hungarian citizen in 2019 (21.02l) consumed 8.82l more wine than a Slovak citizen (12.20l). Slovakia and Hungary have several wine-growing areas, of which the yen is shared, specifically the Tokaj area, and we can say that this area is also recognized in the world. Although Hungary and Slovakia are not among the top producers in Europe, we can say that they have high-quality wine.

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A Critical Analysis of Urban Land Policy Formulation and Implementation in Ethiopia: What is there and what is not?

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Abstract

The purpose of the study was to assess urban land policy implementation in Ethiopia. In undertaking the study, the descriptive survey method was employed. Questionnaires and interviews were employed for data collection. 847 questionnaires were collected from implementers and users and 32 interviews were conducted with experts, middle, and top managers. Descriptive statistics were applied for data analysis. The results of the data analysis were presented using frequency, percentage, & mean. The major finding indicates the policy was formulated by the top policymaker and citizens and implementers have not participated. The offices of land management relied on outdated instruments to implement the policy. Furthermore, the behavior of implementers, the cooperation and involvement of stakeholders, resource availability, political issues, and leadership and governance are the key factors of urban land policy implementation. The economic capacity of the country, the increment in population, the complexity of illegal work on urban land, problems with commitment and sincerity, problems with service delivery, delays in the approval of housing plans, a lack of responsibility, a delay in addressing problems and the problem of good governance are also factors in the implementation process. Generally, the masses do not benefit from the policy, aside from the few wealthy people. As a result, citizens are not satisfied with the formulation and implementation of the urban land policy. Thus, the policy should be revised based on the interest of the masses and modern systems should have to be implemented in the policy implementation process to implement it effectively.

Key words: *Ethiopia, Factors , Formulation, Implementation, Urban land policy*

JEL Classification: *R14, R38, R52*

1. Introduction

Public policy formulation in democratic countries is a dynamic mechanism involving a variety of governmental and non-governmental institutions and actors (Rahmat, 2015). The importance of policymaking in public administration derives from the fact that no public action can be undertaken without a specific goal and a well-defined policy (Marume, 2016). Politicians, bureaucrats, the private sector, or a mixture of these are all capable of initiating policy. Interest groups can push changes in administrative procedure that become de facto policy, or policies may develop across a structured framework (Power & Tolopa, 2009). Therefore, public policies, as part of the broader context of a political system, are a reasonably comprehensive, enforceable, authoritative, binding, legitimate, deliberate, and purposeful framework of and for interaction within which elected political office-bearers can make a variety of public decisions, and public administrators can put various courses of action into practice (Marume, 2016).

Any government's ultimate goal is to improve the quality of life for its people while also promoting growth and development. The achievement of these noble objectives means that the public bureaucracy not only formulates policies, but also implements them efficiently (Ugwuanyi & Chukwuemeka, 2013). In order to achieve the policy goal, the public sector bears the burden and obligation of policy implementation (Ezeani, 2006). A well-crafted policy is important for effective policy implementation (Rahmat, 2015). The policy implementation

stage is an operational period in which policy is actually put into action in the hopes of solving a public issue (Theodoulou & Kofinis, 2004). Policy objectives can only be met if an appropriate implementation and control mechanism is in place (Rahmat, 2015).

"In principle, the effective implementation of public policies determine, the level of provision of social services, the level of industrialization, the available employment opportunities, the size of social security, the creation of social and economic inequality, the availability of financial services for economic activities, the availability of health facilities, and the level of educational development" (Ugwuanyi and Chukwuemeka, 2013). Successful policy implementation also necessitates the assistance of a champion or advocate who can assist in securing appropriate resources and motivating employees to provide opportunities for physical activity (Salvesen et al., 2008). Moreover, the quality of a policy is just as good as how well it is implemented (Rahmat, 2015). The execution of policies is difficult. Controlled experiments are unlikely to reflect real-world implementation scenarios, and given the nature of the field, controlled experiments are unlikely to be representative of real-world implementation scenarios (Signé, 2017).

Generally speaking, the ruling party's philosophy and political strategy shape policy formation and implementation in Ethiopia, the political and logistic realities of governing such a large and complex country, the influence of key players (including the international community), and the lack of capacity at all levels of government (Taylor & Teshome, 2007). Moreover, Vaughn and Tronvoll (2003) said that Ethiopia has a less systematic, less consultative and top-down policy formulation process. However, some researchers and the ruling party argue that the public policies are well and brilliantly formulated but ineffectively implemented. As a result, public policies fail to achieve the objectives for which they were designed. Wide gaps are evident between policy goals and what is obtained on the ground due to ineffective implementation.

Urban development is influenced by urban land policy (Zewdu & Malek, 2010). "The most effective way of gaining an insight into the urban land development policies is to evaluate the process of policy implementation. Efforts should be made to foster a better understanding of urban growth through policy evaluation in the fields of urban growth and expansion. Post-implementation evaluation can teach us much about this, particularly in those developing countries experiencing extreme problems. It can suggest alternative approaches to urban land" (Azizi, 1998).

Therefore, a critical analysis on formulating and implementing the urban policy of Ethiopia is timely. Urban land is the area most exposed to conflict and fraught with the complications of management in Ethiopia because it is a major socio-economic asset and the dispute over who controls the land, which is similar to the issue of who controls power, has played a big role in Ethiopia's past and may continue to do so in the future (Melkamu and Shewakena, 2010). Therefore, this study comes up with findings on the practice of urban land policy formulation, its implementations and its key factors. Finally, the questions of what is there for urban land policy formulation and implementation and what are not were answered in this study. The following specific questions were addressed in this study:

1. How was the urban land policy formulation process in Ethiopia?
2. What seems to be the implementing process of urban land policy in Ethiopia?
3. What are the factors influencing the urban land policy implementation in Ethiopia?

2. Data and Methods

This study employed a descriptive survey method. This method was selected because the nature of the problem requires a wide ambit of description and investigation. The study is descriptive because it helps to make a detailed analysis of existing phenomena with the intent of employing

data to justify current conditions. Both primary and secondary data sources were employed in this study. Data from the primary data source was collected using key informant interviews and questionnaires. Moreover, the secondary data studies on policy implementation were analyzed. Data gained from primary and secondary sources was triangulated. Within the method of triangulation, data triangulation and theory triangulation were both employed. The primary and secondary data were analyzed mainly using both qualitative and quantitative methods. Thus, a mixed approach was employed in this study. Finally, the study employed a cross-sectional design since data were collected at a time.

A multi-stage sampling method was employed to collect data. First, representative regions in the country were chosen. Thus, the four major regions (Tigray, Oromia, Amhara, and SNNP) were selected purposively and one emerging region (Benishangul-Gumuz), and one city administration (Addis Ababa) were chosen randomly. Second, in Addis Ababa, sub-cities were selected randomly, whereas in the regions, the capital cities were chosen purposively and the other three big cities were selected randomly. Third, the institutions implementing the policy were selected purposively. At the last, the individual respondents were selected systematically. Thus, 847 respondents were selected for this study.

The respondents for the interview were selected purposively based on the reason that they have better information concerning policy implementation and the position they possess. Thus, regional and town officials who are working on the implementation of the urban land policy were selected to give information concerning policy implementation. 32 officials and professionals were recruited for the interview.

In this study, both qualitative and quantitative data analysis techniques were used. Data collected through questionnaires was entered into the data analysis software. In the quantitative analysis, simple statistics were employed. Within these simple statistics, the study discussed using percentage, mean, and standard deviation, etc. to address the objectives. In the qualitative analysis, the data obtained through interviews was analyzed using thematic analysis. The qualitative data was first transcribed and summarized according to the objectives of the study. Finally, the results were summarized into tables and descriptions so that the analysis and meaningful interpretation of results could be made to draw conclusions and implications.

3. Results and Discussions

This chapter analyses and discusses the major findings of the research based on the survey collected in the study area. The variables were presented using tables and percentages to indicate the findings on the policy formulation and implementation process of the policy. First, the policy formulation process in Ethiopia was presented and then, the implementation process.

3.1. Policy Formulation Process

Table 1. Participation on urban land policy formulation process

Variables	Cases in percent					Mean
	SDA	DA	UN	A	SA	
The urban land policy formulation was participatory	13.1	29.5	34.9	19.0	3.4	2.70
Citizens participate in policy-making through formal means	18.1	35.9	28.0	15.5	2.6	2.48
There is a strong legal framework that maintains active participation of key stakeholders	14.7	34.4	28.1	19.7	3.0	2.61
The policy is formulated based on consent of beneficiaries	17.2	43.1	26.9	11.4	1.3	2.36
Attitude surveys were made from the community on the policy formulation process	14.5	39.0	27.3	16.2	3.0	2.54

The community appointed a few representatives as advisory groups who have influenced the policy makers	14.0	40.4	26.8	15.6	3.2	2.53
The responsibility of policy formulation was shared between the people and policy makers	15.9	40.7	27.4	13.7	2.4	2.46
The policy formulation was initiated and influenced from the people	17.8	42.1	23.9	11.5	4.8	2.43
The people had genuine power in the policy formulation process	21.3	41.2	25.2	11.0	1.3	2.29
The people were allowed for feedback and negotiation in the policy formulation process	17.5	42.2	26.3	12.5	1.5	2.38

NB: SDA=Strongly Disagree DA= Disagree UN= Uncertainty A= Agree SA=Strongly Agree

As it is indicated in Table 1, the mean scores of all the items are below 3.00 which shows a tendency towards the negative side. Most of the scores are reclined on the disagree position and some of them are on the uncertain position but there is no item above the mean. This means that most of them agreed that the policy formulation process was not participatory while some were not sure about it.

Moreover, the interview results indicated that the policy formulation process was not participatory at the grassroots level. The majority of the experts and implementers do not have a thorough understanding of the formulation process of the policy. Even they do not know how and when it was formulated. Higher regional officials revealed that the participation of every citizen in the policy formulation process is impossible; instead, citizens get to reflect their opinion through their representatives. So, some higher regional officials and representatives have participated in the discussion and ratification process but the society did not participate directly in the formulation process of the urban land policy because the mandate was given to the federal policymakers. Thus, the policy was formulated only by the federal bodies (federal policymakers) without massive participation of the lower bodies or implementers.

For instance higher government official remarked:

Society didn't get the chance to participate and give input directly not only to the policy formulation but also to the formulation of proclamations, rules, and regulations. As a result, we faced various challenges while implementing the policy, proclamations, and rules and regulations. Society was simply a distant observer on the policy formulation process.

Table 2. Consultation on urban land policy formulation process

Variables	Cases in percent					Mean
	SDA	DA	UN	A	SA	
Consultation was made with the direct beneficiaries	15.1	32.7	32.3	17.8	2.2	2.59
Different groups consulted in the policy formulation	15.2	34.1	28.2	17.6	5.0	2.63
Public feedback was taken seriously so as to meet citizens priorities	17.6	39.4	26.0	12.3	4.3	2.50
Key stakeholders are consulted to test the appropriateness and workability of the policy	13.7	36.7	32.3	15.2	2.2	2.55
Public hearings included in the policy formulation	15.2	37.4	28.8	14.1	4.3	2.59
The policy formulation followed two-way flow of information b/n officials & community and vice-versa	17.5	45.3	21.3	13.8	2.2	2.37

NB: SDA=Strongly Disagree DA= Disagree UN= Uncertainty A= Agree SA=Strongly Agree

Table 2 shows that there was no consultation made at the time of policy formulation with the beneficiaries and other stakeholders. The public feedback was not taken into consideration and there was no two-way communication between the people and policymakers. The mean score

of all items is below average. This indicates either that the implementers are not sure about the consultation or that there was no appropriate consultation in the policy formulation process.

The regional government official revealed that:Most of the time policies are formulated without participating and consulting the direct beneficiaries, implementers, and other stakeholders. The professionals who have a thorough knowledge of the area are not also consulted. However, it gets down to the ground for implementation. Thus, the urban land policy is not including the interest of the majority with low income.

The interview results indicated that a consultation with the concerned bodies, especially with the direct beneficiaries, was not made. As a result, the urban agriculture in the big cities was left in danger and the income of urban peasants was negatively affected. The policy formulation process was not supported by scientific research and was realized based on the decision of the top federal policymakers. Let alone the lower classes of society, the implementers themselves were not consulted on the policy formulation process either; instead, they have provided input through a questionnaire to the proclamations, not to the policy. As a result, implementers are implementing the policy without understanding and identifying the objectives and its outcomes.

3.2. Policy Implementation Process

The policy is effective when its implementation process is successful. The success or failure of the policy is measured after implementation. Implementation of a policy needs a modern system and automation. Thus, the following finding discussed thoroughly what requirements were there for the effective implementation of urban land policy and what were not.

Table 3. Systems Availability in the Urban Land Policy Implementation Process

Variables	Cases in percent					Mean
	SDA	DA	UN	A	SA	
There is standardized cadaster system in the city/town	10.5	16.5	35.9	30.0	7.1	3.06
There is modern digital service delivery system on land in the municipality	11.0	21.9	42.5	22.8	1.8	2.82
There is automation system for land registration	9.4	19.6	48.2	20.7	2.1	2.86
There is digital identity number and standardized certificate system on land registration	10.3	22.8	40.7	21.8	4.4	2.87
Effective action taken on the slum houses in the city	10.1	45.0	27.3	15.7	2.0	2.54
There is adequate land provision for unions of the city	10.8	27.9	42.5	14.4	4.5	2.73

NB: *SDA=Strongly Disagree DA= Disagree UN= Uncertainty A= Agree SA=Strongly Agree*

Table 3 indicates that all the items except one have scored below the mean. This shows that a modern urban land administration system is not yet introduced. The urban land management system is still dependent on traditional administration mechanisms. The policy clearly described that the urban land should be administered based on standardized cadastre, modern digital service, automation system, digital identity number for plots, etc. However, these systems are not effective all over the country.

Moreover, the qualitative result indicates the same as the quantitative result. Land banking was introduced in all regions in the near past but it is not auditable and has no effective system

of implementation. Therefore, it is not being implemented appropriately to control and manage the urban land. Moreover, land banking has not been started appropriately, especially in small towns. In general, the land banking system is not effective in the country, although there are beginnings. The reason for this is that a modern handling and management mechanism of the land banking system has not been implemented. There is a land inventory, but the land information system is not effective because of material shortages, a lack of human resources, and a lack of educated employees. Even though the counting of small free plots, the assignment of identity numbers to plots and their registration have been started, the disputes over the ownership rights of small free plots and other lands whose ownership is controversial have not finished. So, without accomplishing all these, it is difficult to bring them into land banking.

The cadaster system was introduced in all regions to implement the policy appropriately. The cadaster system is stand-alone as an office and it has trained professionals who run it as an office. Even though the cadaster office has been established, it is not yet decentralized at the level of all the district towns. However, it has not been functional until now because of material shortage.

The automation and digital services are not yet functional, although they are mentioned in the policy. In some regions, the plot numbers are recorded as a soft copy but still, there is a problem of possessing appropriate software. Except for AutoCAD, there is no modern system utilized in urban land management. For example, in the Tigray region, the introduction of a land parcel identification number was started but it was stopped because of unclear standards. Of course, the files and the land are now in the process of harmonization but the modern systems are not fully functional. Even though there is an interruption in the implementation process, urban land information management is relatively good. But still, there is a poor utilization of technology in the urban land management system, based on the available resources.

Table 4. Actions Taken against the Urban Land Policy Standard

Variables	Cases in percent					Mean
	SDA	DA	UN	A	SA	
The illegal practices in the urban land management are decreased	10.7	23.1	42.2	19.6	4.3	2.83
Sustainable land provision is assured	12.2	22.9	43.4	18.9	2.5	2.76
Green area development is implemented based on the plan in the city/town	9.8	24.7	45.7	17.4	2.5	2.78
The initial cost of lease reviews every year	13.7	22.3	27.5	33.1	3.4	2.90
The informal settlement problems are solved	17.2	26.6	42.3	11.0	2.9	2.59
There is transparent and accessible information on the public procurement and land allocation system	6.5	38.8	34.3	16.0	4.3	3.53

NB: *SDA=Strongly Disagree DA= Disagree UN= Uncertainty A= Agree SA=Strongly Agree*

Table 4 shows the actions taken so far by the implementers based on the policy. The urban land policy stated that illegal actions on urban land would decrease, sustainable land provision would be assured, green areas would be developed, leases would be reviewed every year, and the problem of informal settlements would be solved.

However, it shows that the objectives and actions stated in the policy are not implemented appropriately. Except for the last item, all the items score below the mean. Therefore, there are illegal practices in the urban land management, there is a lack of green area development, no

sustainable land provision, the lease is not reviewed every year and the informal settlement issue is not solved. But there is transparency in public procurement.

Furthermore, the qualitative result indicates that illegal urban land grabbing, illegal constructions and illegal practices on the land are common. The issue of urban land grabbing has decreased somewhat but it has not stopped. The focus group discussants agreed that the lease program is not pro-poor in the country. The lease price does not take into consideration the economic capacity of the people. Therefore, the urban land remains controlled in one way or another by the few economic elites, and the poor are ostracized from the land resources. So, the lease program did not address the interest of the majority because the competition for land ownership through a lease is made among the rich and it is not based on fairness and benefit of the poor. Thus, urban land is monopolized by a few individuals.

The interviewee explained that the policy has clear objectives and strategies. Moreover, it has good proclamations, rules, and regulations derived from it but there are many problems in the implementation process. The employees do not know the objectives and contents of the policy but they know the proclamations derived from the policy. Besides, except the lease proclamation, they took the view that the other proclamations on urban land were good. They agreed that the lease proclamation does not consider the capacity of the poor.

3.3. Factors of Policy Implementation

There are numerous variables that influence policy implementation. There may be an implementation gap due to a variety of reasons, including the policy itself, the policymaker, or the context in which the policy was developed. When a policy comes from the government rather than the target groups, the implementation gap will emerge from the policy itself. This implies that preparation is done from the top down. As a result, the target beneficiaries are not permitted to participate in the creation of policies that impact their lives. In most developed countries, this is the standard (Makinde, 2005).

Table 5. Factors of Urban Land Policy Implementation

Factors	N	Mean	Std. Deviation
Implementers behavior	448	2.9116	.92135
Cooperation and involvement of stakeholders	448	2.8437	.74645
Resource availability	448	2.7035	.83117
Political issue on the policy implementation	448	2.6555	.87701
Leadership and governance	448	2.7955	.74187
Team work	448	3.1873	.82312
Skill and ability of implementers	448	3.1479	.79843
Motivation of implementers	448	3.1533	1.05677

Table 5 shows the factors of policy implementation and their score. The results show that teamwork, motivation and skills, and the ability of implementers are not the major factors affecting urban land policy implementation. Teamwork consists of the collaboration of implementers, the employment of reform tools and teams with different skills. Skill and ability consist of the qualification, experience, problem-solving skill, and analytical skill of implementers. Motivation consists of the recognition, effective evaluation, and incentives of implementers. Although the qualitative result shows that the motivation and the skills of implementers are the main problems, these results show otherwise: the behavior of implementers, the cooperation and involvement of stakeholders, resource availability, political

issues, and leadership and governance appear to be the factors most affecting urban land policy implementation.

Moreover, many factors were identified from the interview discussions. Accordingly: the economic capacity of the country, the population increment, the complexity of illegal work on urban land, problems with commitment and sincerity, problems with service delivery, delays in the approval of housing plans, a lack of responsibility, a delay in addressing problems and the problem of good governance are the challenges in the implementation process. Further, fluctuating regulations, a lack of human resources, a shortage of budget, the dread of employees in making decisions (since land is a sensitive issue), a lack of materials, low levels of technology, a lack of qualified and competent workers, a lack of training, etc. are other challenges. Besides, leaders being changed before addressing the case at his/her hand is another major problem. The institutions are not led by professionals rather the leaders are appointed based on political affiliation. As such, they decide to consider the political issues, not rules and regulations.

The lack of impartial and quick service delivery on land (especially during the implementation of plans to legalize the existing tenure on lands incorporated from rural to urban status), and lack of control over illegal buildings are challenges. Moreover, urban lands that are taken for business purposes are frequently changed to residences. Investors take a large plot of land based on an agreement for development purposes, but they do not follow along with the agreement. Even though the regulation obliges them to adhere to the agreement, the implementers do not influence or punish them. So, when it comes to investors, the rule is commonly violated. Other problems include the lack of automated mechanisms, the delaying of compensation and the lack of land provisions to youth associations.

The informal settlement issue is one of the headaches of the local government in the implementation process of urban land management policy. The government is still unable to address the issue of informal settlements.

4. Conclusions

In the formulation of urban land management policy, citizens, implementers and other stakeholders were not part of the policymaking process. It was formulated by the top policymakers and sent down to the implementers. Therefore, the majority of the experts and implementers did not have a thorough knowledge and understanding of the policy. Besides, there was no consultation made at the time of policy formulation with the beneficiaries and other stakeholders. The public feedback was not taken into consideration and there was no two-way communication between the people and policymakers. All these have negative implications on the implementation process of the policy. Thus, they are implementing the policy without having enough knowledge on the purpose, content, and outcome of the policy. Even though most of the implementers are not aware of the policy, the policy has clear and understandable objectives, it is inclusive, and it has good implementation strategies. However, the urban land policy favors the few wealthy individuals rather than the poor who make up the majority population of the country. The poor are not only segregated from the economic benefit of urban land but also oppressed because of it.

In the implementation process of the policy, there are stories of success and failure. The modern urban land administration system is not yet introduced. The urban land management system is still dependent on traditional administration mechanisms. The policy clearly describes that the urban land should be administered based on standardized cadaster and the use of modern digital services, automation systems, digital identity numbers for plots, etc. However, these systems are not being implemented effectively all over the country.

The study identifies major factors of policy implementation. Among the factors, the behavior of implementers, the cooperation and involvement of stakeholders, resource availability, political issues, and leadership and governance are the key factors of urban land policy implementation. Moreover, issues related to lack of commitment, resources, budget, the economy of the country, responsibility, service delivery, good governance, materials, technology, human resources, controlling illegal buildings, etc. are all among the major challenges of urban land policy implementation.

The major stakeholders had not participated during the policy formulation process. So, there is little acceptance or support from society in the implementation process of the policy. Beneficiaries react in a negative way when they are dissatisfied or disappointed by the service renders. They quarreled and insulted the implementers. Moreover, citizens reflected their complaints through illegal control of urban land, illegal buildings, conflicts with the implementers, and hiding information.

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Water Quality Assessment For Agriculture Application: Which Method Is Preferable?

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Abstract

The article discusses the scientific and methodological problems that arise when assessing the quality of natural waters from the point of a view of their suitability for various types of water use and water use. These issues are especially relevant for the water consumption in the agricultural sector, in particular, for irrigation, fish farming, watering for livestock and poultry. We propose a methodology for integrated water assessment based on the Harrington's desirability function. The scale for assessing the composition and properties of water is shown on the example of fish farming. We have carried out mathematical processing of experimental data to create and interpret water quality index using our own software product has written in Python.

Keywords: *Assessment, agriculture, Harrington's desirability function, water quality index*

JEL Classification: *C43, C89, L95, Q25, Q53*

1. Introduction

Sustainable development of society is impossible without providing quality sources of water supply for drinking, household, agricultural and industrial needs. Given climate change, the water problem is becoming one of the main threats to human existence. Thus, food production in the near future may be significantly reduced due to combining of a sharp reduction of phosphate and nitrogen fertilizers production and due to the catastrophic reduction in the availability on water having a satisfactory quality (World Bank Group, 2021).

The results of natural waters monitoring, organized according to the existing approaches (Kumar, Debele & Sahani, 2021), which is based on the comparison of water composition indicators with the standards set in the form of maximum concentration limits, do not answer the main questions:

1) Are water sources generally suitable for a particular type of water using;
2) How, based on long-term data, to give an adequate forecast of quality change for a long period and to assess the agricultural activity on water quality tendencies;
3) What parameters of the composition and properties of water are critical when using a particular water source for different water consumers?

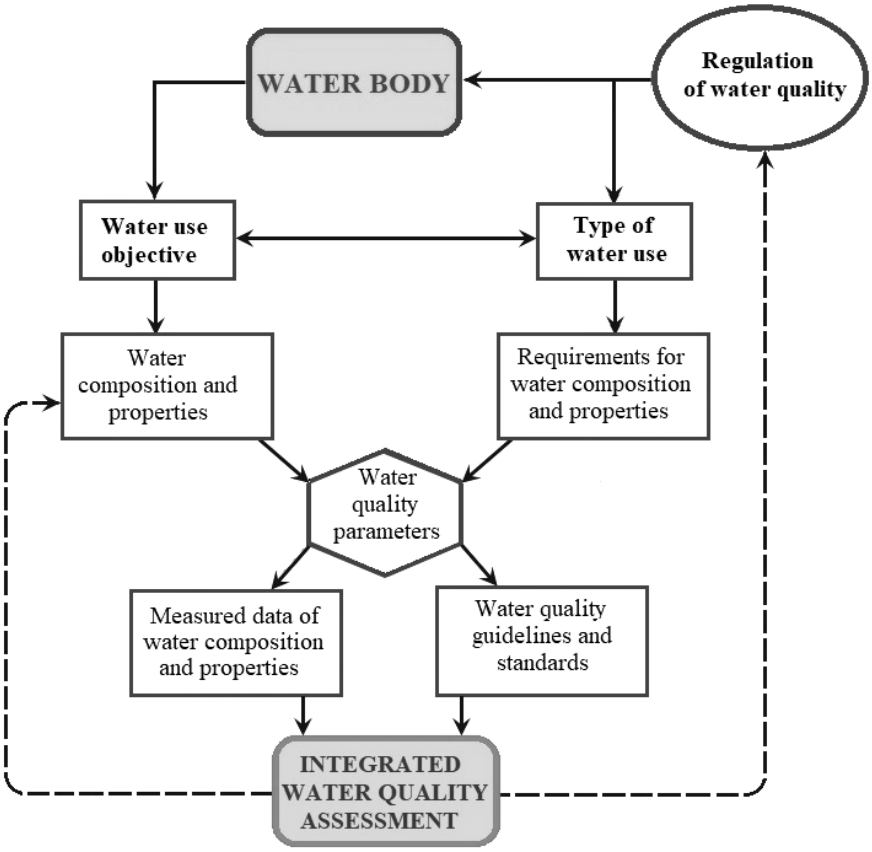
The water quality assessment has a lot of methodical problems associated with the variability of its composition in large water bodies, where the concentration gradients are heterogeneous usually, and are changing in space and time significantly (de Andrade Costa, Soares de Azevedo, & dos Santos, 2020).

1.1. Water Quality Assessment as an ontological & applied issues

So, nowadays the new approach to the integrated water quality assessment is developing. It is based on the summarizing of requirements considering water as a consumer product in terms of a particular type of water use in the form of water quality indexes (WQI) (Stoner, 1978;

Abbasi & Abbassi, 2012; Garcia, Silva & Mendonça, 2018). In particular, for agricultural application these types are: i) drinking water for human consumption; ii) drinking water for livestock and poultry; iii) irrigation, included drip one; iv) fish farming & aquaculture; etc. (fig. 1). The uniting of the separate parameters is made by the different methods: i) differential; ii) complex; iii) integrated.

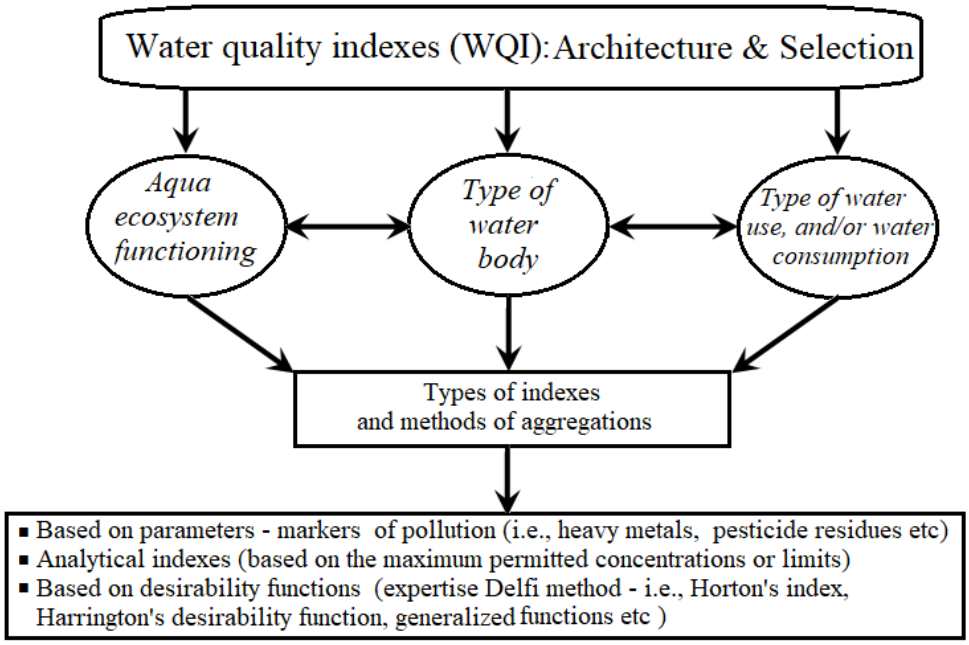
Figure 1. Place of water quality assessment in the structure of water regulating and using strategies



Source: Author

The typical approach to the uniting of WQI of different types is based into rating of water parameters, using weight coefficients (Chandra, Asadi & Raju, 2017). Thus, integrated water quality indicator is an approach that may "to compress" the monitoring data and greatly simplifies the expression of water quality status. The calculation of the water quality index is based on a number of physicochemical and bacteriological indicators. The main advantage of integrated water quality assessment is the effective generalization of individual criteria in order to assess the suitability of source water in a particular industry (Fig. 2).

Figure 2. The main concepts of WQI development



Source: Author

1.2. WQI-generation software and a virtual tool for the calculation of WQI

Calculation of WQIs is a complex and time-consuming process, especially when it is necessary to unite of multi-parametric long-term monitoring big data. Well known that software tools specifically designed for handling Big Data are growing rapidly. Therefore, it is natural to assume that the capabilities of modern simulation tools can be used for:

1) Calculating of quality parameter iterations, and optimizing of a quality scales, weight coefficients;
2) Comparing assessments using various approaches to concept of water quality;
3) Determining of critical indicators which most strongly influence on the overall assessment;
4) And selecting and approbation of the water treatment methods (Hui Cham Sorayya, Malek Sorayya, & Malek Pozi, 2020).

The closest to the aim of our research is the approach which was described by Sarkar & Abbasi (2006). Authors reported that this software has been coded in Visual C++ and integrated with MS Access database. The computer-automated/simulation tool QUALIDEX includes four sub-modules:

1) Data base;
2) Generation of the WQIs;
3) Comparison of the WQIs obtained by the application of different methods of aggregation and transformation of natural parameters of water composition and properties (i.e., the Oregon Water Quality Index OWQI, the Aquatic Toxicity Index, the Overall Index of Pollution, etc.);
4) Generation of a report.

Also, there are a several online calculators (i.e., Water research center website) for educational using primarily. It is developed for the ecological assessment of water sources used Horton's index, as WQI-NSF (Water Quality Index of US National Sanitation Foundation) (Abbasi & Abbassi, 2012).

1.3. Why it is necessary to improve the WQIs?

A critical analysis of the existing variations of the indices, based on Horton's concept, shows a number of common shortcomings:

1) The concept itself was developed more than 50 years ago, and included physicochemical and some microbiological quality criteria, which were the basis for environmental assessment of natural waters. Since then, the list of pollutants has expanded significantly: synthetic surfactants, heavy metals, TGM, residues of pharmaceuticals, pesticides, GMOs, etc. (Kuster, de Alda, & Hernando, 2008). Is it possible to ignore their negative impact on aquatic ecosystems or water use in agriculture, which is currently observed as a result of a sharp increase in anthropogenic pressure?
2) Slightly motivated choice of weight coefficients or analytical curves. Graphical dependences "quality indicator - quality index Q" on the content of coli-forms are unsuitable for estimation, for example, of drinking water quality. If the water contains 1 CFU/100 ml, the WQI-NSF is 99 scores out of 100, while the drinking water quality standard provides for no more than 3 CFU/1000 ml. I.e., the MPC for drinking water is already significantly exceeded. The opposite situation is with nitrate content. For drinking water in accordance with EU and WHO standards, the MPC of nitrate $N\text{-}NO_3$ is not more than 10 mg/l, but with this value of nitrate content quality index according to the WQI will be low - equal to 10 out of 100. The change in temperature is insignificant due to the impact on drinking water quality, while the content of major ions (Ca^{2+}, Mg^{2+}, $Na^{+}+K^{+}$, Cl^{-}, SO_4^{2-}, HCO_3^{-}), which determine the taste of water, is not included. If TDS exceeds 500 mg/l, this parameter is estimated at 20 scores out of 100, although in the irrigation water its MPC is up to 1000 mg/l. In addition, groundwater tends to have higher mineralization than surface water, so the dissolved salt content will dramatically reduce the overall integrated assessment of water, other things being equal, compared to surface water. When evaluating water for irrigation, the TDS weight coefficients should be increased and the indicators of total nitrogen and heavy metals should be introduced, which are strictly normalized for water of this type of water use (Zaman, Shahid, & Heng, 2018).

2. Data and Methods

All mentioned factors are to explain why a lot of researches develop the new approaches to WQIs. We propose to use the Harrington's desirability function which has demonstrated impressive advantages in various areas of water qualimetry (Bikbulatov & Stepanova, 2011; Voitenko & Voitenko, 2017).

The main element for compilation of the separate natural parameters value into one integrated result is how to transform these experimental data into dimensionless quantities - drawing up assessment scales by categories. It is clear that the separate scales of classification of water quality assessment should be done for the every type of water use or consumption.

For example, we demonstrated below how to compile the score scales of fresh waters quality assessment for fish farming. We used the Ukrainian and international guidelines and research data: Directive 2006/44/EC, Council Directive 76/464/EEC, Ukrainian Standard of Agrarian Policy Ministry (USO-05.01.-37-385:2006) Water of fishery enterprises. General requirements and norms; EIFAC Technical Paper. No. 54 Water quality and fish health (Svobodová, Lloyd, & Máchová, 1993) etc. The scales for 25 parameters are shown in the Table 1.

Table 1. Examples of one-side and two-side limits at calculation of d_i - partial Harrington's desirability function

Parameters, units	d_i				
	1.00-0.80 Very good	**0.80-0.63 Good**	**0.63-0.37 satisfactory**	**0,37-0.20 Badly**	**0.20-0.00 Very badly**
	One-side limitation				
Suspended solids, mg/l	0-10	10-25	25-50	50-100	100-2000
TDS, mg/l	0-500	500-1000	1000-5000	5000-15000	15000-30000
Dissolved oxygen (with temperature correction), mg/l	14-9	9-7	7-6	6-3	3-0
Free ammonia N-NH_3, mg/l	0-0.005	0.005-0.05	0.05-0.2	0.2-0.5	0.5-5
Ammonia N-NH_4^+, mg/l	0-0.005	0.005-0.025	0.025-0.39	0.39-0.5	0.5-5
Nitrites, N-NO_2^-, mg/l	0-0.003	0.003-0.01	0.01-0.1	0.1-0.5	0.5-2
Nitrate nitrogen N-NO_3^-, mg/l	0-1	1-2	2-9	9-15	15-100
Total nitrogen, mg N/l	0-0.03	0.03-0.15	0.15-0.9	0.9-5	5-200
Total phosphorus, mg P/l	0-0.2	0.2-0.5	0.5-1.5	1.5-4	4-15
Permanganate index, mg O/l	0-10	10-15	15-30	30-50	50-200
Calcium Ca^+, mg/l	0-40	40-150	150-300	300-500	500-1000
Magnesium Mg^{2+}, mg/l	0-30	30-50	50-200	200-400	400-1000
Sodium Na^+ + Potassium K^+, mg/l	0-20	20-200	200-500	500-1000	1000-5000
Total Alkalinity (hydrocarbonates), mg HCO_3^- /l	0-2.5	2.5-6.5	6.5-10	10-15	15-25
Chlorides, mg Cl^-/l	0-50	50-100	150-250	250-500	500-5000
Sulfates, mg SO_4^{2-}/l	0-40	40-150	150-200	200-500	500-5000
BOD_5, mg O_2/l	0-2	2-4	4-6	6-10	10-50
Iron total, mg Fe/l	0-0.05	0.05-0.2	0.2-1	1-5	5-20
Cadmium, mg Cd/l	0-0.001	0.001-0.005	0.005-0.01	0.01-0.1	0.1-1
Lead, mg Pb/l	0-0.005	0.005-0.01	0.01-0.05	0.05-0.5	0.5-2
Copper, mg Cu/l	0-0.05	0.05-0.1	0.1-0.5	0.50-5	5-10
Zinc, mg Zn/l	0-0.1	0.1-0.5	0.5-5	5-10	10-100
Mercury, mg Hg/l	0-0.0002	0.0002-0.0005	0.0005-0.0010	0.0010-0.0025	0.0025-0.1000
	Two-side limitation				
A pH, units of pH	6.8-8.0	6.5-6.8	6.0-6.5	5.5-6.0	4.5-5.5
		8.0-8.5	8.5-9.5	9.5-10.0	10.0-11.0

Source: Own Calculations

So, for each parameter it should be determined by the type of limitations - they are one-sided or two-sided. Thus, for a pH value, it seems that the best range of values of 6.8-8.0 is indicated. Therefore, this parameter has a two-sided limitation. For most water quality parameters for all types of water use, the restriction will be one-sided and stands on the level of the best water quality.

Our concept has a number of nuances that should be taken into account when compiling a methodology for calculating the quality index. From the formalized position, the absolute value of the desirability function D_{united}=100 corresponds to a chemically pure substance H_2O. But from the point of view of physiology it is known that the life bodies should receive a number of minerals with water. In addition, osmotic pressure of demineralized water is not respond to pressure inside of the cells. Therefore, it is clear that to assess the quality of water for drinking, fish farming, etc., a block of physiological indicators is required, where the limitation of parameters is two-sided. That is, the ideal state will not be the complete absence of all dissolved substances, but their optimal content.

3. Results and Discussion

A test demonstration of the water quality calculations based on the Harrington's desirability function was performed using publicly available data obtained at public monitoring of the Oster River water quality (tributaries of the Desna River) (Table 2). The place of water sampling is downstream and upstream of the river relative to the city of Nizhyn, Chernigov Oblast. Water samples were taken on November 16, 2017. Analytical studies were carried out in the measuring laboratory of A.V. Dumansky Institute of Colloidal and Water Chemistry of National Academy of Sciences of Ukraine (Kyiv, Ukraine).

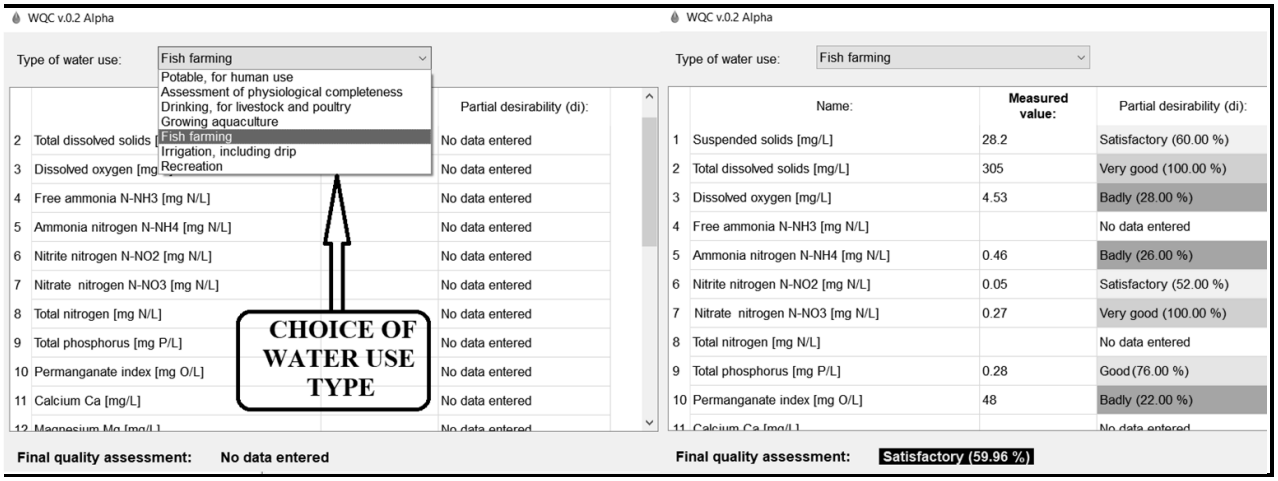
The mathematical processing of experimental data for water quality index compilation in the form of integrated value was done using own software product has written in Python (Figure 3).

Table 2. Monitoring data of river Oster water (data of sampling: 16/11/2017) and calculation of d_i - partial Harrington's desirability function and Integrated water quality assessment

Parameters, units	Place of sampling			
	Nizhin, upstream of the town		**Nizhin, downstream of the town**	
	Measured value	**d_i, %**	**Measured value**	**d_i**
Suspended solids, mg/l	28.2	60 (satisfactory)	25.0	63 (satisfactory)
TDS, mg/l	305	100 (very good)	287	100 (very good)
Dissolved oxygen (with temperature correction), mg/l	4.53	28 (badly)	6.98	63 (satisfactory)
Ammonia N-NH_4^+, mg/l	0.46	46 (badly)	0.48	23 (badly)
Nitrite nitrogen, N-NO_2^-, mg/l	0.05	52 (satisfactory)	0.06	48 (satisfactory)
Nitrate nitrogen N-NO_3^-, mg/l	0.27	100 (very good)	0.38	100 (very good)
Total phosphorus, mg P/l	0.28	76 (good)	0.35	73 (good)
Permanganate index, mg O/l	48.0	22 (badly)	68.0	10 (very badly)
Chlorides, mg Cl^-/l	11.51	100 (very good)	50.52	80 (good)
Sulfates, mg SO_4^{2-}/l	52.27	79 (good)	82.37	74 (good)
BOD_5, mg O_2/l	3.06	72 (good)	3.35	69 (good)
Iron total, mg Fe/l	0.30	60 (satisfactory)	0.23	63 (satisfactory)
A pH, units of pH	7.41	100 (very good)	7.56	100 (very good)
Integrated assessment D_{united}, %		**60 (satisfactory)**		**57 (satisfactory)**

Source: Own Calculations

Figure 3. Screen of calculation window



Source: Own Calculations

13 water quality parameters were summarized, as shown in Table 3. They include both the hydrochemical characteristics (suspended solids, TDS, dissolved oxygen, chlorides, sulfates, pH, total iron,) and pollution markers (nitrates, nitrites, phosphates, permanganate index, BOD_5).

In general, the partial desirabilities d_i of parameters that characterize the influence of natural factors is good and very good excepted suspended solids and total iron. This phenomenon may be explained by the combination of slow coagulation rate of iron compounds at low temperature (near +6 °C) and low dissolved oxygen concentration. Increasing of O_2 concentration (from 28 scores till 62) in downstream point has the effect of total iron concentration decreasing.

Anthropogenic pollution of river waters may be estimated through parameters of ammonia, nitrites, total phosphorus concentrations, and, in terms of permanganate index, BOD_5 especially. Concentrations of nitrogen- and phosphorus-contained substances increased weakly. Perhaps this is due to the end of the rainy season and the end of the vegetation period. The most important evidence of contamination is a significant increase in the permanganate index, from 22 (badly) to 10 (very badly). Dissolved oxygen should be used for dissolved organic matter oxidation processes. This is a very bad thing for a fish.

4. Conclusion

In the present study, water quality assessment was made as the integrated index of 100-score scale based on Harrington's desirability function. We demonstrated the principal possibility to apply this methodology for other areas of water use and consumption, especially for agriculture. The first step is to compile the quality scale estimation. We propose to calibrate it using the ranges established in the guidelines and requirements for a certain productive application – irrigation, drinking or fish farming. The second step is a math transformation of natural values in dimensionless partial desirabilities. And, finally it is transformed into integrated water quality index. In addition, we have developed own software product coded in Python, for the speed treatment of calculation stage.

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The Use of Insect in the Slovak Republic and Consumer Interest in Insect-based Food

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Abstract

At present, there is more and more talk about alternatives in the food industry, mainly due to sustainability and growing demand for food due to population growth. One of the possibilities is the use of insects as part of human food. In the conditions of Slovakia, insects are still unusable due to the lack of legislation, but the European Union is gradually preparing materials for such foods in the country. The aim of this work is to point out and summarize the knowledge concerning the use of insects as food and to evaluate the interest of consumers in Slovakia in this type of food. In this work we will use the analysis and synthesis of knowledge on this issue. The research was conducted using a questionnaire survey using closed-ended questions regarding the willingness to consume insect-based foods. The questionnaire was conducted on a sample of n = 331 respondents perceiving such foods. Based on a questionnaire survey, we can say that Slovaks are willing to try insect-containing foods, even if it is something new for them.

Keywords: *innovation, insects, entomophagy, food*

JEL Classification: *Q00, Q01, Q10, Q13*

1. Introduction

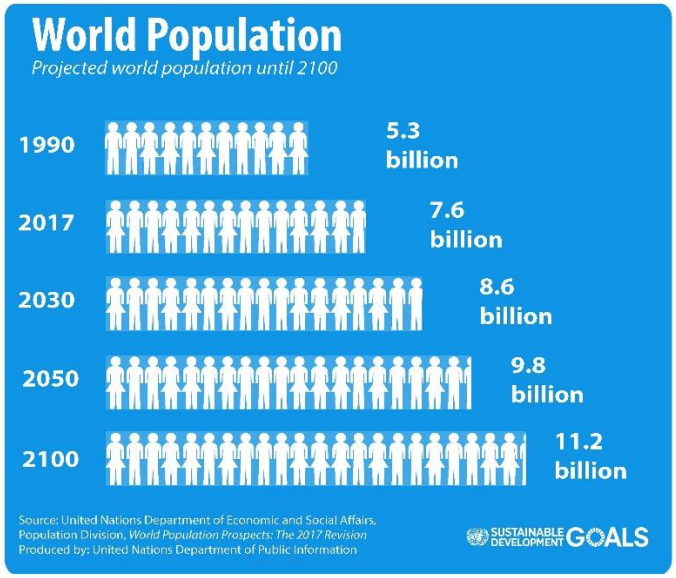
The use of insects as food is not common in our culture and most people consider it something disgusting that they would certainly not consume. However, our ancestors used to eat insects on a regular basis. It was before the animals began to be domesticated and people settled in one place, they became farmers. Since then, it has been easier for a person to raise a large animal at home than to look for the number of insects he would consume every day.

In today's world, however, the consumption of insects is not as exceptional as it seems. Currently, more than two billion people on various continents consume insects on a regular basis. The amount they consume is also large, currently there are several hundred insect species registered in the world that are suitable for human consumption.

In the modern world, we are getting to the point, when there is need for alternative sources of protein because current livestock sources of protein have high environmental cost (Aiking, 2011, pag. 112). Base on several papers (Van Huis et al., 2013, Yen, 2009, 2010), using insects as alternative source of protein has several advantages. Insect show high nutritional characteristics (Rumpold & Schlüter, 2013). According to paper from 2013 (Van Huis et al., 2013), insect production has lower impact on environment compared to other sources of protein. Insect consumption has also economic benefit due to its low costs and high life span.

According to UN Department of Economics and Social Affairs (2017), mankind population is growing rapidly and base on UN statistics, in 2100 there will be population of 11.2 billion (figure 1). This increase of population will need extra resources and food supplies, which can be covered by alternative food sources.

Figure 1.Projected world population until 2100



Source: UN Department of Economic and Social Affairs

1.1. Definition

Dunkel (2016) writes that one of the oldest uses of insects is their use as food for human consumption. The definition of entomophagy is a way of using insects by any organism, but it is most often associated in connection with human consumption. The word entomophagy comes from the Greek words "entomon", which means insect, and "phagy", which means to eat. The name anthropoentomophagy was born directly for the relationship between the use of insects for human use, but the term entomophagy is more widespread in the world and therefore it is commonly used.

1.2. History

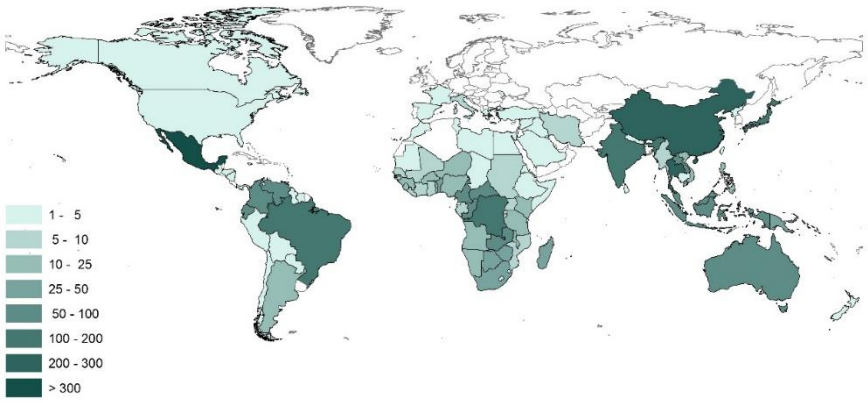
According to Dunkel (2016), insects have played a much larger role in the history of human culture than is commonly known. The impact of insects on human lives can be seen in many aspects of human life, from covering basic needs such as food or medicine to areas such as cosmetics, religion, mythology and science.

FAO (2008) writes that human consumption of insects is a historically and geographically old and widespread phenomenon. From early Asia to Mexico through ancient Egypt, there is various evidence of human consumption of insects.

1.3. The present of entomophagy

According to Huis (2013), insects are consumed worldwide in about eighty countries (figure 2). It is most consumed in South and East Asia but also in Africa, South America and Oceania. There are about two thousand species of insects in the world that are suitable for consumptionon a daily basis. Insects provide a wide range of high-quality proteins, minerals, vitamins and carbohydrates.

Figure 2. Number of edible insect species by country



Source: Center of Geo information by Ron van Lammeren, Wageningen University

2. Data and Methods

Method of analysis - using this method, we analyzed the views of various authors on the issue, and we also analyzed part of the questionnaire survey, which we will use in this work.

Synthesis method - the topic of entomophalology is relatively new in our culture, so we have summarized the knowledge of various authors on this topic in order to create a comprehensive view from several sides

Questionnaire - within the research we used a questionnaire survey. The survey was attended by n = 331 respondents throughout the Slovak Republic. The majority of participants 86.4% were under the age of 35, which corresponded to the targeting of the survey. The survey was conducted using a questionnaire form from Google forms in the time period 06. 02.2021 - 30. 03. 2021

3. Results and Discussion

3.1. Benefits of consuming insects

Suchý et al. (2017) say that insects have the following main advantages:

- rapid maturation of individuals and inclusion in the reproductive process
- fast multiplication
- fast growth (high biomass production)
- efficient use of resources such as food or living space

We can summary all the benefits in three main points:

3.1.1. Ecological benefits

The damesens.cz portal (2020) compares the consumption of commodities needed to produce 1 kg of protein between insects and cattle. According to this portal, insects consume up to two thousand times less water, fifteen times less soil, twelve times less food and, in addition, produce a hundred times less greenhouse gases.

3.1.2. Nutritional benefits

Several global studies led by the WHO (2013) have examined the nutritional value of edible insects. Determining the nutritional value of insects is a key element that can help promote insects as a healthy food source.

The quality of insect meat is, according to Mlcek et al. (2014) comparable to traditional meat, but in several ways even insect meat is of better quality. Insects have a high protein content comparable to beef and milk. In addition, insects contain essential fatty acids that can replace other sources of protein such as meat or soy. The amount of carbohydrates is low, it comes mainly from chitin. Insect fats contain more fatty acids than other animal fats.

Rumpold et al. (2013) add that insects are highly valued for their relatively high energy and protein content for human consumption. It also contains optimal fatty acids with a high content of monounsaturated fatty acids and / or polyunsaturated fatty acids. Another advantage of insect consumption is the high content of minerals such as zinc, iron, magnesium, phosphorus, selenium and copper, but also vitamins such as riboflavin, pantothenic acid, biotin and in some cases folic acid.

3.2. Legislation in Slovakia

It is common in the world to consume insects as food for humans. However, this is not yet possible in Slovakia. As in our country and in other developed countries, the biggest problem is the lack of legislation that would regulate the conditions under which businesses can produce and sell food containing insects.

Gonzales et al. (2018) write that the Novel Food Regulation (Regulation 2015/2283), which entered into force in early 2018, has entered into force in EU countries. That regulation states that if a first go through the EFSA (European Food Safety Authority) approval process. This legislation opens up an opportunity for Member States to use insects in food intended for human consumption. However, specific rules on how to breed and sell such foods are already up to each Member State.

3.3. Risks of insect consumption

Global regulations do not sufficiently determine which species of insects are suitable for consumption. The reason for selecting which species of insects can be consumed is the possibility of transmission of toxins, pesticides, heavy metals or bacteria. There is a high risk of insects that are found in the wild. However, regulated breeding greatly reduces the risk of insect contamination.

The French food agency ANSES (2015) conducted a survey of safety assessments in EU countries related to insect consumption. The Agency agrees that, despite the uncertainty and lack of information, the industry should be controlled through specific standards aimed at reducing potential risks.

3.4. Psychological aspect of insect consumption

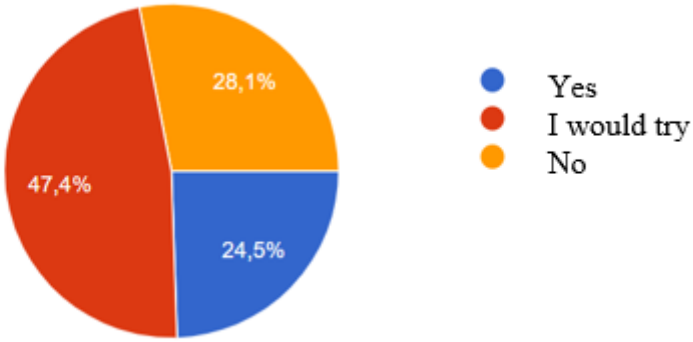
Although in the past insects were consumed everywhere and are still commonly consumed by more than two billion people today, people of Western culture do not consume insects. Based on my own observations, I can say that, among other aspects, it is very important to mention aversion to such a food. An insect is something dirty and disgusting that prevents people from consuming it. This does not apply to everyone. There is always a certain part of the population in the population that is innovative, or rather tries new things. However, this part of the

population is very small and therefore insects are generally considered to be something eccentric or exotic.

3.5. Results of the researched questionnaire survey

As part of the research question, we asked respondents about their willingness to consume foods that contain insect flour in order to increase the nutritional value of the food (figure 3). We found from the survey that up to 71.9% of respondents are willing to consume such foods mainly due to higher nutritional value. In the following graph we can directly see the share of individual answers. The research question was: "Can you imagine consuming foods containing insect flour such as protein bars, pasta, pastries, ... (insect meal is tasteless and odorless)?"

Figure 3.Graph – willingness to consume insect-based food, n=331



Source: Own research

4. Conclusion

Based on the analysis of the sources used, but also our own observation of the situation in the world, we can say that the demands of the population for consumption are constantly increasing and in the future, it will be necessary to increase the volume of food production. However, as it turns out, the traditional way we know will not be enough and therefore it will be necessary to switch to alternative food sources, such as insects. Consumers' interest will initially be lower, but if the insects are processed into flour, their interest will increase.

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Challenges of Online Education in V4 Countries during COVID-19 Pandemic

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Abstract
This research work is intended to investigate what is the situation of education in the times of the COVID-19 pandemic. Some segments are also dedicated to how the governments of V4 countries try and tried to solve the problem of those institutes where the circumstances did not let digital and online education become true.

The article also wants to show how creatively the teachers solved the upcoming problems of digital education in the areas of V4 countries where there is no internet connection at all and how the tutors substitute the internet with other solutions. All in all, this article is intended to give a picture of how education adjusted to the fast-changing world.

I intend to analyze if there were enough sufficient tools and devices for the students to learn during distance education.

Keywords: *COVID-19, Digital Education, V4 countries, Pandemic, Challenges*

JEL Classification: *I24, I21, I20*

1. Introduction

In this article, I am going to elaborate on how the governments in V4 countries handle the situation of the COVID-19 pandemic in the field of education. I also intend to dedicate some paragraphs to how the teachers reacted and found out creative ways to "defeat" the challenges of lack of infrastructure in the rural areas of the V4 countries.

I also intend to mention the situation of students in all the four countries regarding if they could find a quiet place to study during distance education or if they have a proper computer to study. I'm going to observe that is the students and the educators were ready for distance education in all the four Visegrad countries.

2. Literature Review

Polákova and Klímová (2021) mention that in all countries of the world, the pandemic situation required quick decisions in Slovakia as well. From one day to another, students were alone and education became an individual thing with minor help from the tutors.

The definition of online education shows how many differences it has from the so-called "normal" or classroom-based education: "…it is a form of education whose main elements are the separation of teachers and learners, the influence of educational institutions, the two-way communication between teachers and learners, the possibility of occasional meetings, the industrial model of providing education, and the use of technical media." (Poláková & Klímová, 2021, p. 1)

As the education and the devices of telecommunication were developed, from distance learning we moved a step further to online learning. The new technologies make it possible to restore a face to face like communication among the teacher and the students, which is a great improvement in the field of distance education (Poláková & Klímová, 2021, pp. 1-2).

Before coronavirus, online education was only an addition to supply for education. But after the COVID-19 appeared, it was an obligatory feature of everyday education and it caused many problems at the beginning because of the lack of technical devices and skills from the students and tutor sides as well (Poláková & Klímová, 2021, p. 3).

Poláková and Klímová (2021) surveyed the readiness of the students of the distance and online education: „In order to investigate student readiness for distance learning and their perception of such an experience, which was the main purpose of this study, a questionnaire, as the main research method, was conducted at the Secondary Vocational School of Tourism and Gastronomy in Nitra, Slovakia (Poláková & Klímová, 2021, p. 2)."

There were 72 participants in the survey from both genders. The age of the students was between 15 years and 19 years. The questionnaire consists of 15 questions and described 6 more variables. "Student responses were collected at the beginning of the first semester of the academic year 2020/2021. Before students were given the questionnaire, they had been presented with the purpose of the study (Poláková & Klímová, 2021, p. 3)."

The survey was anonymous and non-obligatory. "Despite the fact that modern technologies have become an integral part of students' lives, the authors of this study find it essential to understand whether students are ready to use technologies that are also in the process of distance online learning. The authors believe that students' perception of the online distance learning can help provide a better educational environment in case of future lockdowns or other unexpectable situations (Poláková & Klímová, 2021, p. 3)."

The questions covered 6 fields like Technology and equipment. In this field Poláková and Klímová were curious about if the students have internet access at home if they have a sufficient device with which they can complete the online tasks, Can they recharge their devices regularly, or do they have a telephone connection (Poláková & Klímová, 2021, p. 3).

The second field of the questionnaire was Students' technological skills. In this field, the questions were the following: Do the students have the required skills to work with new technology? Are they able to finish assignments without the direct help of an adult person (Poláková & Klímová, 2021, p. 3)?

The third topic was the learning environment and the supporting questions were like "Can the students focus while they are at home" or "Do they have enough time to complete the tasks" (Poláková & Klímová, 2021, p. 3).

The fourth field of topics was the difficulty level of learning, Poláková and Klímová added the questions like „To what extent and complexity do teachers give you a new curriculum for self-study?" or „Are the tests adapted to the appropriate level of your knowledge?" (Poláková & Klímová, 2021, p. 3)

The fifth approach was the approach of teaching methods where there were three sub-questions:

1. "In what form do teachers assign exercises to practice the curriculum?" (Poláková & Klímová, 2021, p. 3)
2. "Does teaching through the ZOOM application help you understand the subject matter?," (Poláková & Klímová, 2021, p. 3)
3. What activities help you understand the new curriculum? (Poláková & Klímová, 2021, p. 3).

The last or the sixth approach was the Objective Evaluation, where the students got just one question according to the evaluation process "Is the evaluation of your acquired knowledge objective (Poláková & Klímová, 2021, p. 3)?"

Regarding the question of the technical environment, all the participants gave the answer they had Internet access and 82% of the students had devices that are capable to complete

certain online tasks with but 14% had to share their devices with other relatives. Only 4% stated that they have no sufficient devices for finishing the tasks (Poláková & Klímová, 2021, p. 5).

"To get an overall picture of the technology use, according to the survey conducted by the Statistical Office of the Slovak Republic, only 73.5% of the respondents have mobile devices, 18.2% have a laptop, 11.5% have a tablet, and 3% are the owners of different devices. However, the data showed that technological devices were widespread (Poláková & Klímová, 2021, p. 5)."

The distant education in Poland has a quite developed history in Poland but despite that, there were some serious backlogs among the teachers during the quarantine times.

The research of Aleksandra Czetwertyńska, Magdalena Biernat (2021), tells the educators at the first wave were completely unprepared for the challenges of online education. the researchers surveyed almost 1000 primary school teachers who filled out the survey and give the following answers (Biernat & Czetwertyńska, 2020, p. No page)

"Before the outbreak of the pandemic, 85.4% of the surveyed teachers did not have any previous experience with distance learning, although 48% have no difficulties using digital tools; (Biernat & Czetwertyńska, 2020, p. No page)"

As we can see from the numbers most of the teachers did not use any distance learning tool before, which means they were in serious backlogs in contrast to the teachers who have experiences although almost half of the teachers could handle the situation because they know how to use digital tools.

"36% of teachers indicate the lack of equipment in students as one of the key problems with distance education; (Biernat & Czetwertyńska, 2020, p. no page)"

Digital tools are one of the most efficient factors of online and distance education and as the result shows many students did not have sufficient tools for online education.

"Teachers point out that children started to suffer badly from isolation already after the first month. Exemptions from the obligation to follow the core curriculum would allow teachers to be flexible and adapt to the needs of various students in this aggravating situation (also, mentally); (Biernat & Czetwertyńska, 2020, p. No pages)"

The second part of the research, which was conducted from August to October 2020 was intended to observe how the situation is going on almost a semester of distance education and what is the teachers' attitude at the beginning of the educational year (Biernat & Czetwertyńska, 2020, p. No page).

In this period the researchers extended their survey to high and vocational schools' pedagogical staff to get more precise data. The participants gave the following answers:

"Two major problems identified by the respondents at the beginning of the new school year was the high level of time consumption of the remote education process (59% of the respondents) and stress and fatigue caused by it (37%)

Up to 48% of the primary and high schools teachers indicated that at least one of their students "disappeared" (ceased to actively participate in lessons or entirely stopped contacting) during the distance learning period. In the vocational schools the percentage reached 58%;

YouTube and other video platforms were the most often used sources for preparing the remote classes. As much as 84% of primary and high schools' teachers and 75% of vocational schools' teachers confirmed using them. (Biernat & Czetwertyńska, 2020, p. No page)

According to Łukasz Tomczyk (2021) the online education in Hungary is during a reform in the question of methodology and Corona virus is forced the reform to be more faster than it would have been otherwise (Tomczyk, 2021, pp. 10,)

"Higher education in Hungary has long been undergoing a major reform in terms of methodology. This virus has forced" Hungarian universities to jump immediately into online education and "forces this (digital online) direction in the future. (Tomczyk, 2021, p. 10)"

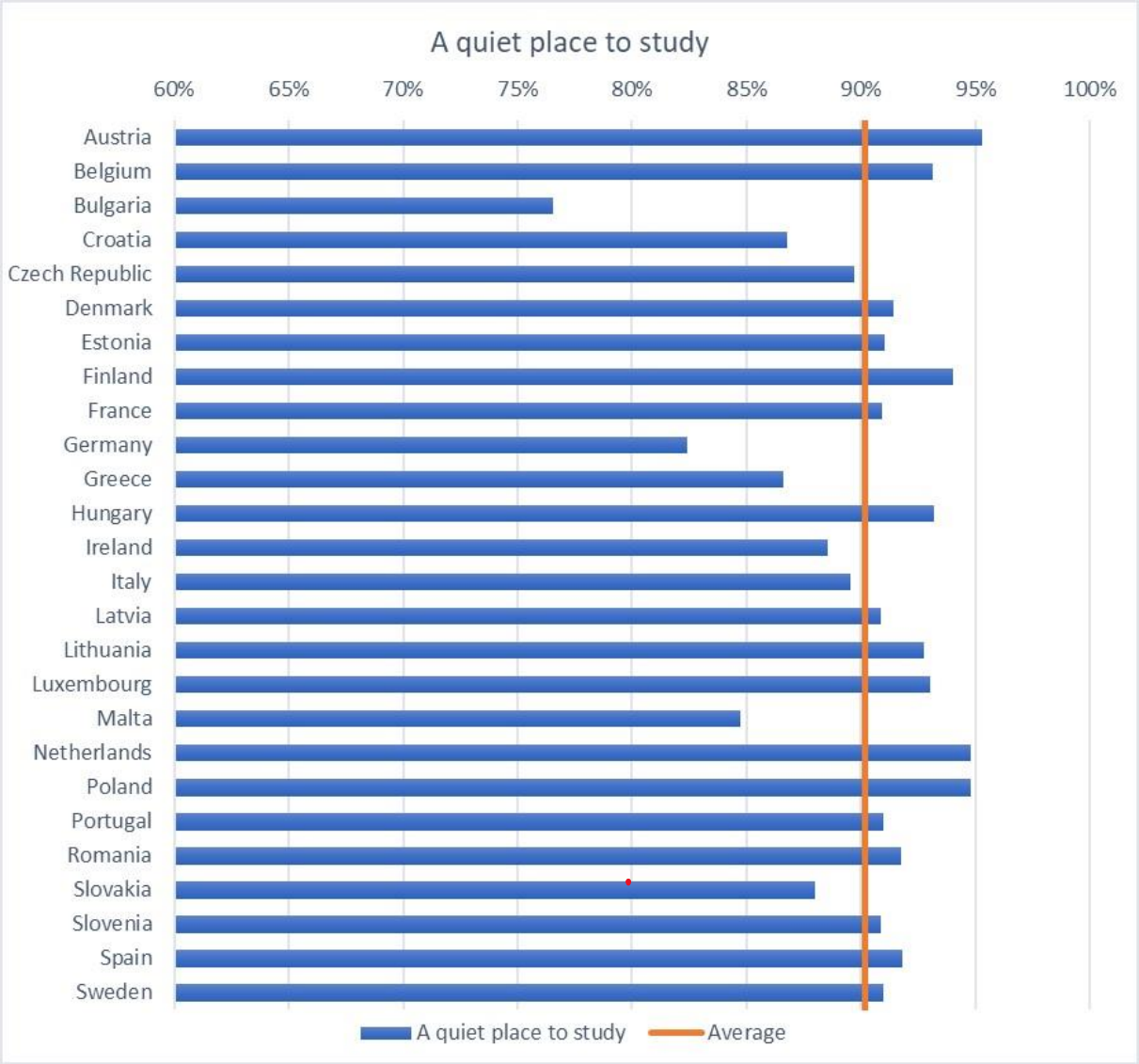
2.1. The Situation of Education V4 Countries during the COVID-19 Pandemic

Slovakia

As the results of Poláková and Klímová show, the situation in Slovakia was quite normal. Of course, their research was non-representative which is why we cannot get a full picture of the situation from this article.

As one of the OECD's graph shows, the Slovakian students of 15 years old was below the average regarding the question of a quiet place to study. Since the average was 90% Slovakia had approximately 85% on the graph.

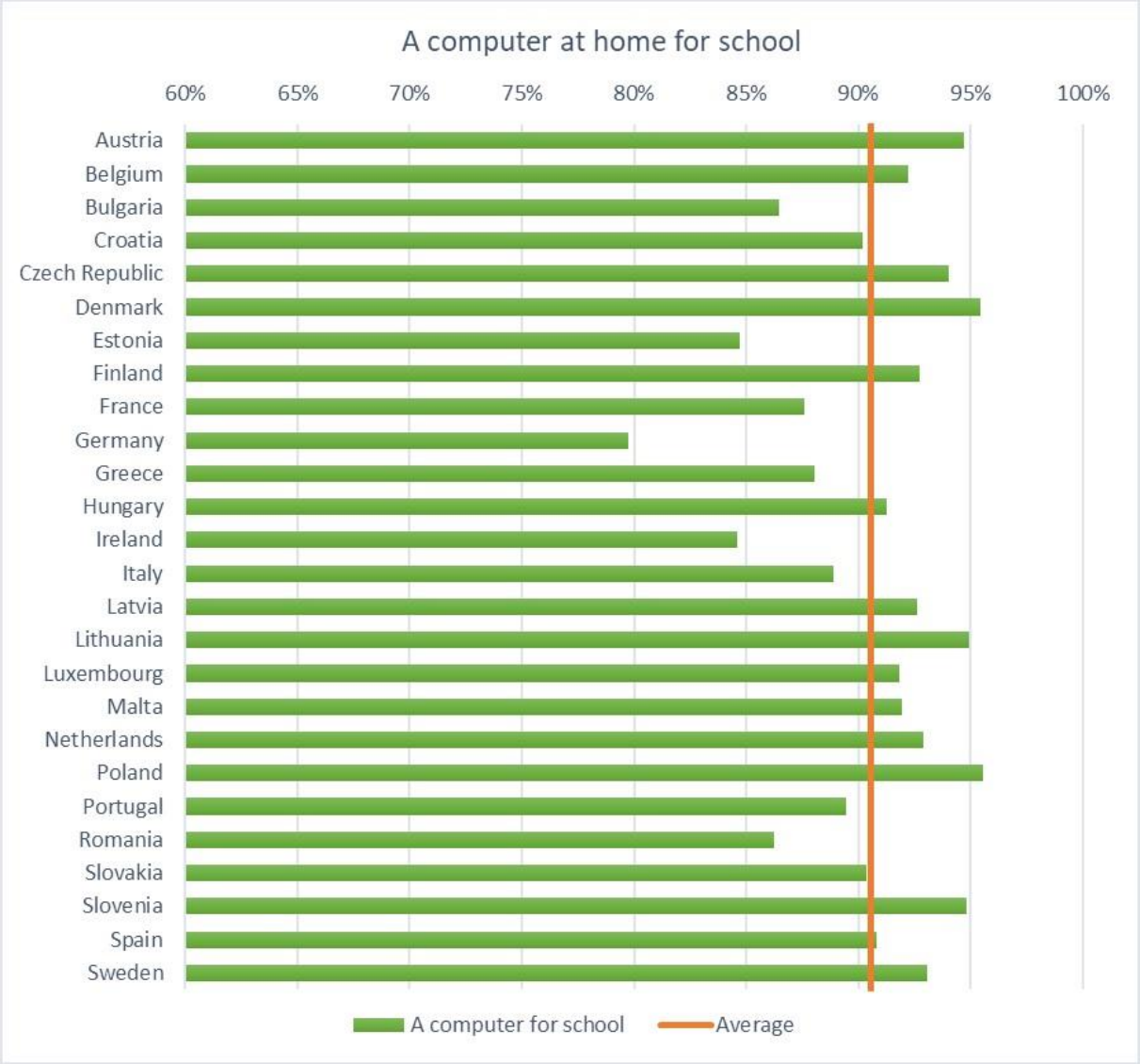
Figure 1. A Quiet Place to Study



Source: (data.europa.eu, 2020, no p.) https://data.europa.eu/hu/impact-studies/covid-19/education-during-covid-19-moving-towards-e-learning

For the question of whether the students have a computer at home to study, Slovakia almost reached the average.

Figure 2. A Computer at Home for School



Source: (data.europa.eu, 2020, no p.) https://data.europa.eu/hu/impact-studies/covid-19/education-during-covid-19-moving-towards-e-learning

Hungary

For the question of whether students could find a quiet place to study, Hungary's value was above the average (93%) since the average was 90%. This means that the country of Hungary in this regard is in a quite good position beside Belgium or Finland.

In Hungary, the number of students, who have a proper computer for school, is above the average. With these results, Hungary is beside the Czech Republic and Poland.

Poland

Poland is far in the best position among the V4 countries in the question of students' quiet place to study. Poland almost reached the 95% average with Austria, Malta, and Finland.

Poland reached the 95% average regarding the number of students who have a computer at home for school, so this country is the first among the V4 countries again and it went side by side with Estonia, Finland, Lithuania, and Austria.

Czech Republic

The Czech Republic is below the average in the question of Quiet places to study. This country is after Poland and Hungary but before Slovakia among the V4 countries. The Czech Republic goes side by side with Ireland, Greece, and Italy in this issue.

The Czech Republic is above the average of 90% of Computer for School issues, which means the country is before Slovakia, side by side with Hungary and behind Poland in this issue.

2.2. Education in V4 countries with Lack of Technology

Hungary

According to Mizsur and Barakonyi (2021), the situation of online education in Hungary in the rural areas was quite chaotic because in many places there were no sufficient devices or networks to take part in online education (Mizsur & Barakonyi, 2021, no p.)

There were villages and farms for example in the Borsod region where the students could use the only computer with internet access of the mayor's office, and that is how they participate the lessons or the primary school teachers run around between the students and put the printed tasks into their mailboxes and the end of the day the tutors collected and corrected them (Mizsur & Barakonyi, 2021, p. no p)

Slovakia

The report of the Organisation for Economic Co-operation and Development (OECD) on Slovakia tells in Slovakia the tutors and the students were ready enough to solve the sudden situation of Online Education during the Pandemic (Organisation for Economic Co-operation and Development, 2020, p. 5)

„A pre-requisite for any type of online learning activity is that students have access to a computer. According to PISA 2018 data collected before the crisis, this is a precondition that was not met by all students before the COVID-19 pandemic hit (Organisation for Economic Co-operation and Development, 2020, p. 5).

Poland

The report of OECD on Poland tells the readiness of students and teachers regarding the IT skills and equipment were high enough to overcome the non-regular situation of COVID-19 Pandemic (Organisation for Economic Co-operation and Development, 2020, p. 5).

Students were also capable to learn with the instruction of their parents and other facilitators from the family (Organisation for Economic Co-operation and Development, 2020, p. 5).

Czech Republic

As the report of OECD tells in the Czech Republic Schools were prepared to the online and distance education. The IT skills and equipment availability were high enough to easily overcome the inconveniences of the COVID-19 pandemic (OECD, 2020, p. 2).

3. Methodology

I analyzed scientific articles and graphs to find out how were the V4 countries managed education during the pandemic times. As Poláková and Klímová (2021) mention in their study, the situation was quite manageable in Slovakia and the Graphs of Data.europa.eu (2020) also supports these facts.

I also analyzed the studies of the OECD to find out how the V4 countries reacted to the sudden situation of school closing.

4. Results and Discussion

As revealed from the articles and graphs the Online Education worked in all four countries but for example, in Hungary, there were regions where the infrastructure was not sufficient enough to manage proper online education, and distance education required some creativity from the side of the teachers.

Also, there was some backlog in Slovakia in the question of the students have enough devices to connect to the online lessons and if they can find some quiet places to study but all in all the four Visegrad countries handled the question of online education well.

In the future, it will be worth studying the long-term effects of pandemic years regarding the effects of online and distance education as well.

5. Conclusions

All in all, in the V4 countries Online and distance education were well managed in most of the countries. The IT level of the teachers and students was high enough to overcome the challenges of the sudden change. However, we know there were some sub-regions in Hungary for example where online and distance education meant a bigger challenge than the most developed parts of the country.

It is also revealed from the researches at the beginning of the pandemic teachers of Poland were very inexperienced in the question of distant education. Although the teachers get used to online education and use digital tools frequently many of the students were disappeared during the online education period.

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Waterfront Development and Regeneration: A Review of Issues and Opportunities

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Abstract

Waterfront development as a key contributor to spurring regional economic growth and infrastructure development has become a common phenomenon worldwide. However, intensive development and human activities on the waterfront areas could cause land-use changes, which directly or indirectly influence the environment and landscape condition. In this paper, a comprehensive review is present in order to clarify and classify the main issues and challenges associated with waterfront development or regeneration. It draws upon the research and experiences from several representative waterfront cases study to summarize the demands and potentials of current waterfront regeneration projects. It argues that future flexible policies are required to achieve a balanced land use pattern and meet the sustainable development of the lake region.

Keywords: *waterfront development, waterfront regeneration, waterfront land use, lakeshore*

JEL Classification*: Q56, R11, R12, R14, R58*

1. Introduction

Waterfront usually identifies the area of interaction between settlements and the water, water edge in cities and towns, or city port and harbor front (Timur, 2013). In the earlier research, most of the studies have generally identified "Waterfront" as a junction area of the water body and land, such as the coastal, riverside, lakeside, river edge, waterside, and creek front. Waterfront development areas involved diverse combinations of land uses and purposes, industrial uses (factories, harbors), commercial services (shopping mall, market), entertainment and recreational (parks, beaches, trails), and tourism-oriented uses (attractions and resorts). Bruttomesso (2001) identifed that the activities of waterfront development normally contains: recomposition, regeneration, and recovery.

The phenomenon of urban waterfront development has spread geographically since its starts in the US in the 1960s, where original transformations of the industrial structures or deserted ports into the creation of public spaces, and festival marketplaces, what could be accomplished in waterfront areas close to the city center (Smith & Garcia Ferrari, 2012). As the concept of waterfront redevelopment has become an effective tool for urban planning and politics since the 1980s (Timur, 2013), many waterfront cities regard the item of waterfront development and waterfront redevelopment as identical with vigor and exuberance (Chang & Huang, 2011). The related forms of urban development in waterfront areas reveal shorter development and alteration cycles, which transmit different forms of land development and architectural environment (Smith & Garcia Ferrari, 2012).

In the 21st century, the waterfront has strengthened the attention to tourism development and turned local needs for recreational waterfront space to the external areas (Cheung & Tang, 2015). When reviewing the existing research and comparing the approaches, the studies of waterfront development are often in an urban context and examined with usually an emphasis on the social, economic, cultural, governance aspects (Papatheochari & Coccossis, 2019). Consequently, the research about waterfront development in rural areas and its impacts on the sector of physical characteristics and aesthetics are still rare.

2. Advantages of waterfront development

Doucet and Van (2011) argued that the large waterfront regeneration projects have bought quality of life improvements for the neighboring residents. The perceptions from the local communities are generally positive, particularly the poor residents in the neighbor of the regeneration area. Waterfront developed as creation environments or new innovative uses area could stimulate the establishment of creative industries and social services, which can produce potential positive economic, social, and cultural additional effects for the broad local communities (Kostopoulou, 2013). Oliva (2006) has stated that the waterfront developed have positive effects on the housing market and house price of the surrounding neighborhood. Property-led development (like accommodations, hotels, tourism attractions, towels, shopping centers) in waterfront areas directly leads to the increased values of the resident's properties (Doucet et al., 2011; Remenyik & Csilla, 2018). In addition, another study on Lake Tourism points out that the most noticeable benefits of tourism-oriented waterfront development are (Hall & Tuija 2006):

1) providing opportunities for new uses and recreational activities.
2) provide job and study opportunities
3) the improvement of transport and social services
4) new amenities

3. Issues in waterfront development

While the government and the developers are attracted by the economic benefits of developing waterfront spaces, the public is concerned about how waterfront development can address social needs and increase community benefits (Cheung & Tang 2015). Thus, waterfront revitalization projects sometimes pay great attention to commercial opportunities but not much to the social needs of the surrounding neighborhoods (Hoyle, 2000). Standing water bodies received many modifications and pressures during the 19-20 centuries (Dokulil, 2014; Schmieder, 2004), which are strongly related to the intensive use of shoreland and development activities (Furgała-Selezniow, Jankun-Woźnicka, & Mika 2020; Remenyik et al. 2013). The direction of land changes that raised the risk of waterfront landscape resources degradation is mainly because of the constantly developed settlements and build-up areas (Furgala-Selezniow, et al., 2012). Modifications of shorelines and shore buffer zone organize an increasing threat to the ecological condition and naturalness loss of waterfront (Carpenter et al. 2007). Real estate speculation in the inner harbor areas of American since the 1970s caused the increasing prices of homes, pointed where new residents no longer afford a new house on the waterfront (Krausse, 1995). A resident's perception survey about the waterfront development was produced from (Krausse, 1995), the residents were considered the accessibility, pollution and equitable development as the primarily concerns.

4. Tourism-oriented waterfront development

Tourism development generates economically beneficial impacts and mostly positive influence relevant social part in the waterfronts (Pomucz & Csete, 2015). Improper tourism development can result in increased tension in waterfront areas. And change the physical feature, economic, and socio-cultural characteristics of the destination (Puczkó & Rátz, 2000). The negative impacts of tourism development can progressively damage the environmental resources it depends on (Dokulil, 2014).

Regarding the issues of tourism-oriented waterfront development, Hiltunen (2007) have stressed that expansion of second homes and tourism accommodations on the lakeshore threatens the water and lake ecosystems, the growth of second homes often causes irreversible changes in natural landscapes and heritage sites. The disturbance caused by tourism development affects not only water but also coastlines and catchments (Dokulil, 2014). Recreation and tourism have impacts on the waterfront areas through a large number of facilities and tourists, resulting in habitat degradation, trampling, littering, and wildlife disturbance. Interrupted high aesthetic waterfront scenarios (Krause, 2001). Moreover, Liu (2008) has declared that the tourism development in the lake region directly affects horticulture and declined agricultural land use and arable land use because farmers adapt to the needs of tourism by engaging in varying high-value tourism products.

4.1. Waterfront development in the Lake Balaton

Lake Balaton is the largest freshwater lake in central Europe, and the most popular holiday destination in Hungary. Lake is the core of a distinction' attractiveness at lake Balaton, Hungary (Hall & Härkönen, 2006). Tourism development in this area had already started in the 1840s. After the 1920s, Lake Balaton as a vacation destination increased its regional attention, which result in the speedy development of accommodations and entertainment facilities. In the 1930s, as the new mode of transport of railways was introduced and connected to the capital, it efficiently reduces the traveling time and distance between other cities and the lakefront destinations, which boost the visitor numbers and the development of tourism accommodations. Driven by economic reform and new policies launched in the 1960s, contributed to the growth of waterfront development and renovation projects in the lake regions of Hungary. The pastoral land-use pattern in lake Balaton changed by the beginning of the 1970s due to the land privatization policies and speculation prospects, division of the land into small plots, and heavy construction along the lake leading to the loss of agricultural land, and the fragmentation of a large number of small plots (Buday-Sántha, 2007). Nearly 60% of all the current private accommodations were built in the 1970s which has brought a negative change in the balance of natural and man-made environmental elements (Puczkó & Rátz 2000). To harmonizing the tourism, advise impacts on the lake, the regional planning plan of Lake Balaton increasing the size of the nature conversation areas (Wettstein, 2013).

Lake tourism is closely connected to the water-related development concepts, has specific infrastructure requirements (Furgala-Selezniow et al., 2006). By decades of lakefront development in lake Balaton, increasing tourism activities (swimming, yachting, fishing, etc.) have been considered as the most pollution factor on the lake environment. Like other lake regions in Hungary, the issue that has recently attracted extensive attention is the deterioration of water quality in the Lake Balaton region. Since the lake and water is the base resource of the tourism industry, it has to withstand excessive pressure and pollution from the overwhelming visitors and tourism activities in the peak season (Puczkó & Rátz, 2000). With the development of real estate and the value increase potential of the land, a large number of semi-natural areas have been transformed into tourism investment land for resorts and second homes (Lőrincz, Grósz, & Csapó, 2021). Concrete shore walls and building belts were developed around the lake, which directly led to the fragmentation and the loss of semi-natural land (Buday-Sántha, 2007).

Although the tourist number and guest nights of commercial accommodation are significantly declined at Lake Balaton from 2000 to 2015 (Remenyik & Csilla, 2018), lake tourism and rural tourism still have great potential at lake Balaton due to the market development. The waterfront of Lake Balaton still has an important status in rural tourism and domestic tourism. And the government is continuing to invest in recreational development of

the lake regions and the lakeshore (Figure 1) and attract foreign investment companies to carry out tourism apartment development on the waterfront (Figure 2).

Figure1. Recreational development at Lake

Figure2. Resort development project in the lakefront

Source: https://magyarepitok.hu/， March 11,2021. a=New bicycle path is being built at the southwest corner of Lake Balaton (about 10 kilometers of bicycle paths connecting Balatonberény with Vörs); b=A new apartment resort development project in Balaton boglár started in March ,2020

5. Conclusion

Waterfront development and regeneration as a popular planning tool for recovery or reviving the shore zone of the city-water adjacent areas arouse modern development and vitality. Waterfront development covers a wide range of discussions on social, cultural, economic, and ecological aspects. Among the issues and benefits of waterfront development reviewed in the paper, economic and property profit commonly plays a notable role in waterfront development proposals. The majority of negative concerns about the impacts of waterfront development are mainly on the ecological and environmental sections.

Due to the waterfront area often recognized as a space that has unique natural characteristics and leisure potential, there are always contradictions and debates about planning purposes of waterfront development, and the attention between the environment and economic interest, the needs and tensions between the residents with the government, and the tourists.

The waterfront development in the Great Lakes region and coastal areas has attracted more and more attention, and its aesthetic value, cultural and environmental characteristics are facing more challenges. Common social goals require the provision of nature-based entertainment facilities, the protection of heritage features, and the promotion of a sense of place (Angradi et al. 2019). Cheung (2015) proposed a query about the waterfront development in the modern harbor city: The planning mission of waterfront in modern cities is leisure, attraction, or social order? Indeed, waterfront development itself is a complex phenomenon, which accommodates various policies and social needs. There may be deviation if only from one perspective. Therefore, it is noteworthy that when new policies or planning projects are designed to stimulate economy and attractiveness, the impact of ecology and culture cannot be ignored.

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Understanding Mongolian Poverty in Sustainable Development: The Perspective of Their Overseas Higher Degree Student

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Abstract

This paper seeks for actual meaning of sustainable development among Mongolian overseas higher degree student who stay in Hungary. Sustainability is not only about being green or focused on environment issues, but also it is all about the quality of human life. This study reviews the concept of sustainable development and sustainable development on regional level by focusing on poverty index. The data was based on the Mongolian case in the period between 2015 and 2018. Structured interviews were conducted on students to get their perception about poverty to the existing indicators. As a result, the meaning of the indicator numbers with the knowledge and experiences of students will be obtained so that it will provide a more in-depth robust meaning giving perspective on poverty conditions.

Key words: *sustainability, economy, sustainable development, regional sustainable*

JEL classification: *I32, Q01*

1. Introduction

Poverty is a serious problem that is of concern to the world. Efforts made by various countries and world bodies to reduce poverty continue to this day (United Nations, 1993, 2020b). This challenge is getting tougher due to the COVID-19 pandemic which has made the poverty rate soar. As part of the SDGs goals, freedom from poverty is linked to the ideals of sustainable development (United Nations, 2020a).

Since 1972, the world has more aware of sustainability. There are many international and local committees that concentrate environmental issues such as carbon dioxide, toxic chemicals, wastes, pollutions, and other ecosystem damages. Under urgent pressure of those environmental issues, global leaders and scientists have worked on innovations and solutions for sustainability. It is now generally agreed that economic growth, environment sustainability and human development are linked together as sustainable development. Thus, the three pillars of sustainable development are environment sustainability (ecosystem integrity, biodiversity), economic sustainability (growth, equity, and efficiency) and social sustainability (participation, social mobility, social cohesion). Improving a single dimension is not sufficient to accomplish sustainable development (Moisescu, 2015).

In traditional view, economy and environment are separated although they have some areas that overlap. The current view of economic development includes sustainability and quality of life. Economic development is not only about having more available options or getting a big number, but it is more about improvements in quality of life and standard of living (Greenwood & Holt, 2012). (Daphne T.Greenwood). Sustainable development and economy are coherent and emerging topic as well. It requires to act locally, regionally and to think globally. Sustainability is not only good for the environment and climate but also for innovation and

economic development. From economic perspective, it can be defined as increased total output or income, but the economic development is more multidimensional which are sustainability and overall standard of living (Fitzgerald, 2010).

Traditionally, Mongolian economy was based on herding and agriculture, but it has transformed to mining. Thus, Mongolia has numerous challenges and developmental issues. Among the fundamental phenomena hindering sustainable regional development the following can be listed: deforestation, air and water pollution, loss of biodiversity, unemployment and underemployment, equitable access to justice and poverty (HØJER, 2007).

From the sustainable development perspective, all mentioned issues should be addressed on the development plan. The main goal of this paper is to discuss and analyze the position of Mongolian sustainable development level in terms of sustainable development indicators using data between 2015 and 2020. The index represents the sustainable development implementation standards and fulfilment as the basis for developing ranking. It can also represent quantitative tools which can be used for evaluation and decision-making. Therefore, the paper tries to contribute what the sustainable development in terms of theoretical aspects and to monitor the sustainable development index using poverty indicator score of Mongolia. In this study, we elaborate on the views of Mongolian students studying abroad. The experience and knowledge they gain on abroad and the comparison of what they had experienced in Mongolia will become a new perspective on the meaning of regional development.

2. Literature Review

2.1. Sustainable development

Whether forests, seas, and land or natural resources are an essential part of human life not only for economic development. Environment and development are coherent and cannot be separated. It is undeniable that when the environment and natural resources degenerate and its destruction increases, then there will be no development. Since the early 1970s, the UN conference have raised the environmental issue and healthy and productive environment. This conference built the hopes for better international cooperation on sustainable and environmental issues. Since then, each Earth Summit and UN conference has discussed how to achieve sustainable development. One action program called Agenda 21 for the 21st century where the Earth Summit in Rio raised people's awareness of the environment for all, local, national, and international (ILO, 1996).

Sustainable development is defined as development that meets current needs without jeopardizing future generations' ability to meet their own. Sustainable development is a very complex and broad term to define by simple consideration since it comprises ethical, societal, institutional, and environmental dimensions (UNEP, 1987). Above all, sustainable development can be generalized as a developing process by ecologically and human manner referring to process towards to future excellence. It aims to improve the living standard, and it is conditioned by the need to respect nature's ability to provide resources and life-supporting services. In this perspective, sustainable development means improving the quality of human life while living within the carrying capacity of supporting ecosystems (Clement, 2000).

Sustainable development can be divided into three main components which are economic sustainability, environmental sustainability, and social sustainability. Economic sustainability denotes economic indicators such as Gross Domestic Product (GDP), Gross National Product (GNP), inflation, unemployment; environment sustainability indicators are biological diversity, living environment, protection of natural resources, biodiversity, managing wastes, and pollution; social sustainability encompasses variables such as socioeconomic, health, equity, and accessibility. One of the findings of Pike, et.al. (Pike et al., 2007), regional development is

not only about the economic context but also prosperity, well-being, and general quality of people's lives.

Till 2000, only economic indicators were considered as development then starting from 2004 as Haughton and Counsel, and Keating 2005 broadened the definition of regional development that includes social inequality, sustainability, environment, culture, social and diversity. Since then, economic development is for accomplishing social welfare, infrastructure and quality of life considering the culture and the certain populations. Even though there are several local (Central bank, Welfare services), macro-regional (European Union) and global organizations (World Trade Organization) for regional development, no studies have differentiated the local and regional sustainable development. Furthermore, quality of life is not the same for all who live in rural areas or in metropolitan areas. It is also noted that it is hard to fulfill all the desires and well-being by one development strategy. Due to geographical location, living standards and social welfare distribution affect differently where one benefits and the other loses. The correlation between economic efficiency and social equity is a repetitive matter (Pike et al., 2007).

2.2. Poverty Indicators

There are several indicators used to measure poverty. The World Bank emphasizes that poverty is measured by consumption by the community. The consumption includes Food Component, Non-Food Component, Durable Goods, Housing, and Energy (World Bank, 2018). Details of the various components can be seen in table 1 below.

Table 1. Poverty Index Components

Food Component	Non-Food Component	Durable Goods	Housing	Fuel & Energy
flour and flour products; meat and meat products;	footwear for men, women and children, jewelry and souvenirs, textiles, education, health, recreation,	domestic appliances, electronic goods, and furniture, to vehicles and other transportation goods	characteristics such as the main material for floor,	
fish and seafood; dairy products; eggs; oils and fat; fruits and berries; sugar and jam; other foods; tea	beauty and toiletry products and services, cultural expenses, household goods, durable goods,		walls and roof, number of rooms, access to water, electricity, heating, location, etc.	
and coffee; mineral water and soft drinks; alcoholic beverages;	housing expenditures, transportation, communication,			

tobacco and cigarettes	insurance, and taxes	

Source: The World Bank (World Bank, 2018)

Another poverty category created by the United Nations Development Program (UNDP) in 1997 is known as The Human Poverty Index (HPI). Its index created people-centered indicators to measure the depth of deprivation across countries using three main indicators: a short life, lack of basic education, and lack of access to public and private resources (Mowafi, 2004). There are also indicators that The Multidimensional Poverty Index (MPI) is published by the UNDP's Human Development Report Office. More specifically the following deprivations can be seen in Table 2 below. Deprivation can be conceptualized as a continuum which ranges from no deprivation through mild, moderate and severe deprivation to extreme deprivation (Gordon, 2005).

Table 2. Deprivations Challenges

No	Deprivations
1	Adult or child malnourishment
2	Disrupted or curtailed schooling (a minimum of years 1-8)
3	The absence of any household member who has completed 6 years of schooling
4	Child mortality within the household within the last 5 years
5	Lack of access to safe drinking water
6	Lack of access to basic sanitation services
7	Lack of access to clean cooking fuel
8	Lack of basic modern assets (radio, TV, telephone, computer, bike, motorbike, etc.)
9	Lack of access to reliable electricity

Source: indicators. Report (SDSN, n.d.)

By compiling and synthesizing the poverty indicators above it can be concluded that poverty indicators must pay attention to the consumption, basic education, access to public and private resources in any deprivation.

2.3. Higher Degree Student's Perspective

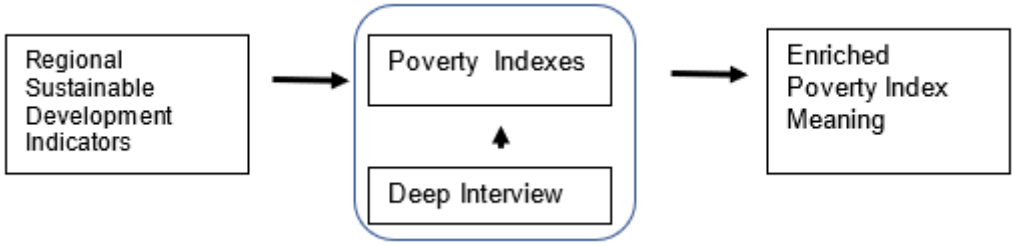
Globalization as one of the economic processes which has had an impact on Higher Degree Education. Thus, the globalization impacts on perceptions of the quality and level of knowledge is required to higher degree student (Hemsley-Brown & Oplatka, 2016). The concept of critical thinking is strongly connected with discourse surrounding the international atmosphere of higher degree student. It acts as a filter for information to guide actions and beliefs, and the use of this filter is something that can be trained and improved, in order to be used in an 'intellectually disciplined' among students (Gyenes, 2021). Furthermore, the young have to be developed all the time for prospective growth of a nation and advocates in shaping and sustaining in wider perspective (Sofi & Nika, 2017). Students in higher education typically design, conduct, and report their research projects, instilling key scientific method skills in the process (Obuku et al., 2021). Using their perspective to enrich the data will have reasonable approach.

3. Methodology

The research design adopted a qualitative approach. The paper objectives consisted of two phases as follows. At first, poverty development index measurement in a quantitative manner has been constructed from Mongolian Government data source. Four dimensions which are consumption, basic education, access to public and private resources. The presented analysis of sustainable development concept implementation is a general assessment, focused on the selected aspects, meeting which affects the overall implementation of the sustainable development concept. Each selected variables represent important role for sustainable development such as social, economic and environment. In this case it focuses on poverty issue. We have collected open-ended interview questionnaire from students who study for bachelor, master, and PhD degree, between 19- and 33-year-old both male and female students in Hungary. The interview questionnaire that consists of five list of questions that are about food consumption, primary education, public services, and opinion of Mongolian poverty.

Secondly, after knowing the value of each category, then we compare it with the perceptions of Mongolian students who have or are studying abroad. We conducted interviews using structured interviews based on poverty index indicators. The results of the interview will show a judgment that will add to the facts of the official figures obtained from Mongolian government data. In general, the steps of this research are depicted in the Figure 1 below.

Figure 1. Research process



Source: researcher, 2021

4. Results and Discussion

According to the Mongolian National Statistical Office and the World Bank survey, the national poverty line was estimated at 166,580MNT (around 70 USD) per person in 2018. The poverty level is defined based on the cost of consuming the basic-needs basket that provides 2100 calories per person per day.

From table 3 as shown below, from 2010 to 2018 Mongolia's poverty rate experienced ups and downs with its lowest rate at 21.6% and highest at 38.3%. During the economic boom years, the poverty rate has dropped from 38.8percent in 2010 to 21.6percent in 2014 respectively on the national level. Although, differences between urban and rural poverty rate were quite high which were 10.5% and 7.4%. In urban area,16.4percent were living below the poverty line while 23.8percent in rural area. Rural areas always occupy a larger portion than urban areas. In 2012, 30.4percent of the rural population was poor, compared with 19.9percent of the urban population overall. The gap between urban and rural areas has been decreasing starting from 2016. Even though, economic growth has been shared predominantly, inequality has still shown.

Table 3. Mongolian Poverty rate, 2010-2018

	2010	2011	2012	2014	2016	2018
National	38.8%	33.7%	27.4%	21.6%	29.6%	28.4%
Urban	31.2%	25.8%	19.9%	16.4%	24.8%	25.9%
Rural	37.3%	34.6%	30.4%	23.8%	31.8%	30.1%

Source: worldbank.org and www.nso.mn

Due to urbanization, almost half of the Mongolian population currently live in the capital city, Ulaanbaatar. Therefore, less difference has been shown between national and urban area. As defined by the World Bank, Poverty headcount ratio means the percentage of the population living below the national poverty line. The poverty headcount dropped by 1.2percent in urban area while 4.1percent in rural area between 2016 and 2018 as shown below table 4. On the national level, it declined from 29.6percent to 28.4percent in 2018. However, the poverty gap (intensity of poverty) which measures the depth of poverty by estimating how far off households are from the poverty line, was even estimated as 7.2 for both national and rural.

On the other hand, the number of poor people in Mongolia is dominated by people living in urban areas and accounts for up to 63% of all poor people nationally by years 2018. There was slight decline in number of poor from 907.5thousand to 904.9 thousand on the national level. More than half lives in urban area that were counted as 574.6 thousand in 2018. While the number of poor people increased in urban area, the number decreased from 343.7 to 330.3 thousand in rural area. Even though, poverty headcount was higher in rural area, the share of the poor was less comparing with urban area.

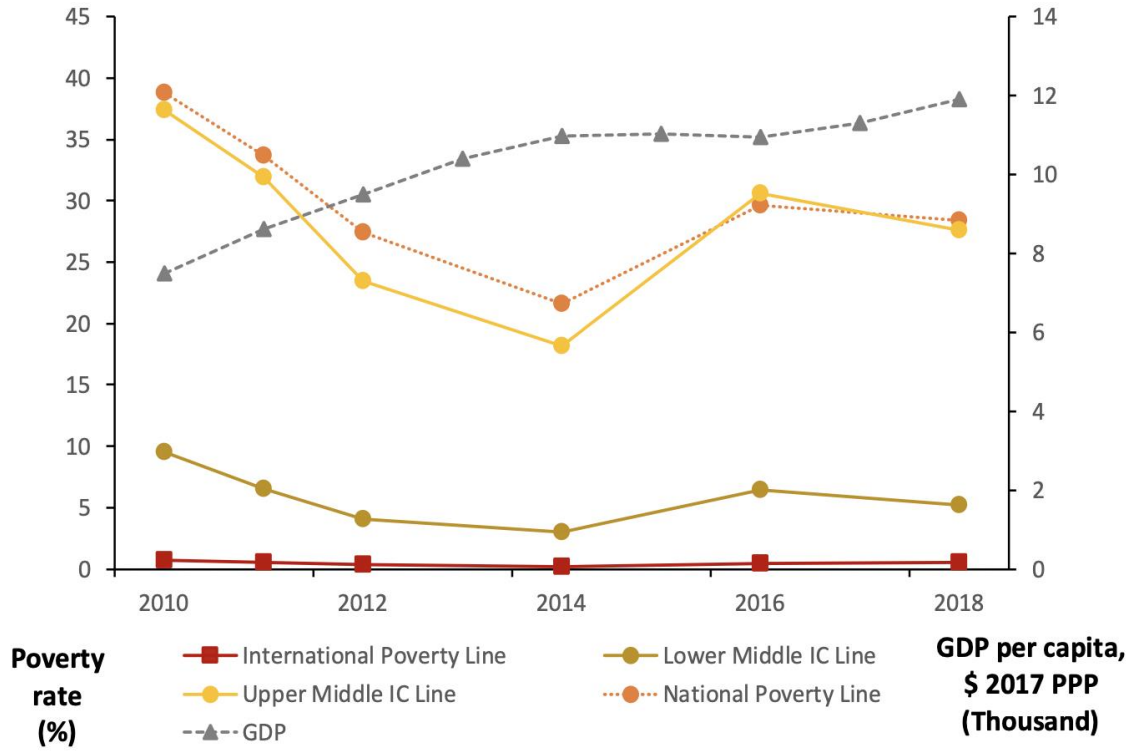
Table 4. Mongolian Poverty Indicators, 2016-2018

	Poverty headcount		Poverty gap		Number of the poor (‘000)		Share of the poor (%)	
	2016	**2018**	**2016**	**2018**	**2016**	**2018**	**2016**	**2018**
National	29.6%	28.4%	7.7	7.2	907.5	904.9	100%	100%
Urban	27.1%	27.2%	7.2	7.2	563.8	574.6	62%	63%
Rural	34.9%	30.8%	8.8	7.2	343.7	330.3	38%	37%

Source: worldbank.org and www.nso.mn

Below graph compares the national poverty rates with international poverty, GDP growth per capita, and lower- & upper-middle-income rate from 2010 to 2018. As shown in the graph, even there was steady growth in GDP per capita from 2010 till 2018, the poverty line was still uneven. Over those years, the bottom 40percent reached 1percent annual growth in real consumption, which is one third points higher than the average per capita consumption growth. By means that, the national prosperity could not reach for those who left behind and the inequality remain same.

Figure 2. Poverty rate, 2010-2018



Source: databank.worldbank.org

Based on the indicators above, we compare the perceptions of overseas higher degree students who are studying in Hungary. The poverty index variables will be confirmed with the understanding and experience of those who are considered to have knowledge and comparison with other countries.

4.1. Consumption

The money spent on food per week was almost doubled in Hungary comparing to Mongolia. Average Mongolian student spends 24$ per week in Mongolia whereas food expenditure in Hungary was almost doubled approximately 55$ per week. This shows that poverty conditions in Mongolia represent unsustainable consumption since the price disparity is very high. Whereas to achieve sustainable development and a higher quality of life for all people, states should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies (UNEP, 2011).

Mongolian traditional cuisine was the most preferable food when they were in Mongolia while chicken, pasta, fast food, and other Hungarian food became preferable in Hungary. Most of them enjoy the food choices in Hungary. Some of students find it easy and some finds it hard due to language barrier or the price of the products. This is in line with the perceived value is found to have a significant positive effect on consumers' intention to buy the product (Yadav & Pathak, 2017).

Because the person has embraced the cultural aims and experiences emotions socialized to the cultural norms, carrying out the activities that are valued within the culture is likely to lead to feelings of well-being (Diener & Biswas-Diener, 2002). Most of the students prefer Mongolia for shopping as they got used to in Mongolia which is easier to communicate and price of the product.

4.2. Basic Education

Each interviewee has a different view on basic education enrollment since they all have different experiences in Mongolia. As they find it easy to enroll in primary school or school admission but hard to enroll in kindergarten. Even though, primary education is accessible and available for all kids, interviewees are not satisfied with the overall quality of basic education and behaviors of teachers. Due to large number of students, around 40 to 50 students in a classroom for government-funded schools, makes hard for teachers.

Furthermore, the current Mongolian education system is more likely Russian style that be taught more scientific subject matters from early age. It may also be that Mongolia is ranked 5th, consider good, on the Global Innovation Index (GII) for countries with a Lower middle-income group. GII is an annual ranking of countries by their capacity for, and success in innovation (WIPO, 2021). As for Hungarian primary education, most of interviewees do not have any experiences, but one said that Hungarian primary education is good enough that have enough facilities per pupil and more balanced school training comparing to Mongolia. Therefore, interviewees prefer to change this current education system.

4.3. Access to Public and Private Resources

The social organizations and company should be built on SDG-specific values, with people, context, and collaboration at the forefront. These values signify what used to be a chance. It is vital to keep conveying the SDG; nevertheless, communication must be accompanied by action. From the answers of the interviewees, it can be settled that traffic congestion and public transportation as part of public facilities are too bad in Mongolia specially in the capital city. Since there is no metro or tram, the bus is only public transport in Mongolia with no private competition. Thus, buses are not comfortable, cold in winter times, no air-conditioning during summer and travels rarely. As all given the same answers on the public transportation service in Hungary, that is the best as they all enjoy. The public transportation operates 24hours a day and has a plenty of choices such as tram, buses, metro, and train, while there are only buses operate in Mongolia. From their perspective on the public services, it should be managed by private sectors to improve the services. Moreover, the city infrastructure should be broadened and be upgraded as well. Most importantly, they all had similar thoughts about the poverty in Mongolia.

The villager's income, education, safe drinking water, and social equality did not reach the internationally agreed minimum standards of SDGs, although the overall wellbeing improved during recent decades (Fang et al., 2021). On the other hand, they all pleased with medical services that doctors are well qualified in Mongolia. To overcome the poverty, they suggest that welfare benefits and cash handouts should be reduced. Since there are plenty of welfare benefits from the government, majority of people tend to stay home without working. Therefore, reducing the welfare benefits and creating a place of work that is fair and suitable for anyone, are the key to overcome poverty in Mongolia.

5. Conclusion

Poverty data in the form of several indexes will be able to be given a deeper meaning by exploring the opinions of higher degree students who have different experiences in other countries. Overall result indicated that students who study in Hungary, are satisfied with the variety of choices for food, public transportation, and other basic needs. On average food expenditure, they spend twice more than in Mongolia. Main differences between Mongolian and Hungarian primary education are facilities and curriculum. For instance, there is just one-hour physical training subject once a week in Mongolia and 99% of courses are being taught in

the classroom. Certain economies that are ranked lower in the GII overall are, however, leaders in specific areas. Mongolia is among the top 30 countries in terms of innovative thinking. These disparities in economic performance also point to evolving and dynamic innovation systems with the potential to improve overall performance in the future (WIPO, 2021) for Mongolia.

When it comes to social sustainable development, social welfare and cash handouts are excess as for now. People, context, and collaboration are at the core of the social organizations' economy, which is built on SDG-specific ideals. These numbers represent what was once a chance. It is critical to continue to communicate the SDG; but, communication must be supported by action (Herranz de la Casa & García Caballero, 2021). As for their perspective on how to overcome poverty of Mongolia; It would be beneficial if the policy makers reconsider the social welfare and create a good place of work where people want.

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Mitigating Aerosol Usage through Communication Intervention

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Abstract
The statement "aerosol" may juggle up view of things that come in spray cans but means something rather different to scientists. After series of research carried out on the above word, it turns out that aerosols have a greater role to play in climate change and global warming than initially thought. Aerosols are tiny particles in the air that can be produced when we burn up different types of fossil fuels such as coal, wood and biofuels in diverse way. Sources of aerosols are pollution from vehicles, chimney and cigarettes which could lead to air pollution and later affect one's health. Aerosols have a complicated suite of different effects on the planet, but humans have directly impacted their presence, abundance, and distribution. Through education, campaign and creating awareness to the community, aerosol can be mitigated. Many kinds of dust from ground-up rocks, are light-colored and even a little bit reflective. When the sun's rays beam down on them, they bounce the rays back out of the atmosphere, preventing that heat from ever reaching Earth's surface. The effect can be dramatic: The Mt. Pinatubo volcanic eruption in 1991, in the Philippines, spewed the equivalent of 1.2 square miles of tiny, reflective rock particles into the high stratosphere—cooling the planet for two full years afterward. Flecks of black carbon from burned coal or wood, do the opposite, absorbing heat from the sun as it beats down. Their influence on clouds formation and growth due to the interference with bouncing back effect. Water droplets coalesce readily around particles, so a particle-rich atmosphere promotes cloud formation. White clouds reflect incoming sun, preventing it from getting to the surface and warming land or water—but they also absorb the heat that the planet is constantly emitting back outward, trapping it in the lower atmosphere. Therefore, the study focused on finding out the linkage between aerosols and climate change, its injurious impact on human health, and how aerosol levels can be reduced, and it was situated within the framework of Health Belief Model (HBM) and social ecological model (SEM) have been utilized to execute this examination.

Keywords: *Aerosol, Communication, Intervention, public health.*

1. Introduction

Environmental pollution issues have occupied a pride of place in the advanced countries of the world for quite some time. However, Nigeria has only started devoting the required attention to this very important area within the last two decades. Prior to this time, concern for the environment did not go beyond local municipal sanitation matters. The lack of environmental pollution awareness in Nigeria for so long could be ascribed principally to ignorance on the part of policy makers as well as the general citizenry in whose perceptions, pollution was thought to arise from manufacturing industries alone. The sources of pollution of the Nigerian environment are not much different from other places only the degree and specifics differ. In general, environmental pollution comes from both natural and anthropogenic sources and they affect all sectors of the environment soil, water, and air, from which human health is impacted.

Art Sedlacek (2016), an atmospheric scientist at the U.S. Department of Energy's Brookhaven National Laboratory, describes aerosol as tiny particles emitted from factories, forest fires, car exhaust, and sometimes from natural sources. Air pollution in cities routinely exceeds levels safe for human health (Landrigan et al., 2018) and it is also detrimental to vegetation, crop yields and building materials. These tiny emission has presented dangers to

food security in many non-industrial countries including Nigeria due to the environment subordinate nature of farming frameworks and absence of adapting abilities. Regular environment cycle and human exercises have added to an increment in the gathering of warmth catching "nursery" gases in the air in this manner adding to increment in temperature in the worldwide environment (an unnatural weather change) (UNFCCC, 2007). A worldwide temperature alteration causes flighty and outrageous climate occasions sway and progressively influence crop development, accessibility of soil water, woods fires, soil disintegration, dry seasons and the preferences.

These natural issues result to low and capricious harvest yields, which perpetually make ranchers more helpless, particularly in Africa (Ziervogel et al., 2006; UNFCCC, 2007). Desertification, uncontrolled touching, animals' relocation, poaching/settlement inside secured regions, bushfires and deforestation likewise presented dangers to the conditions. Every one of these unfavorably influenced farming and food supply, new water assets, normal environments, biodiversity and human wellbeing, compromising human turn of events and their social, political and monetary endurance (Zoellick and Robert 2009). Therefore, the study focused on figuring out the linkage between aerosols and climate change, its injurious impact on human health, and how aerosol levels can be reduced.

1.1. Global Trend of Hazardous Atmospheric Pollutants

It has been observed that there are long-term trends in surface air quality in United Kingdom, India, amongst many others with air pollutant concentrations that pose a greater risk to health than previously thought (Vodonos et al., 2018; Vohra et al., 2021).

In United Kingdom, vehicles make a large contribution to air pollution year-round, with seasonal contributions from residential fuelwood burning, agricultural activity, and construction and sporadic contributions from the long-range transport of Saharan dust (Fuller et al., 2014; Crilley et al., 2015; 2017; Harrison et al., 2018; Ots et al., 2018; Carnell et al., 2019). Despite the decline in emissions, many areas in the UK still exceed the legal annual mean limit of NO2 of 40 μg m−3 (Barnes et al., 2018), a threshold that may not adequately protect against the health effects of long-term exposure to NO2 (Lyons et al., 2020). There has even been a recent increase in NH3 emissions of 1.9 % a−1 in 2013–2017 (Defra, 2019a), attributed to agriculture (Carnell et al., 2019).

In India, most especially, Delhi and Kanpur, year-round emissions are dominated by vehicles, construction, and household biofuel use in the city and industrial activity and coal combustion nearby (Guttikunda and Jawahar, 2014; Venkataraman et al., 2018). Seasonal enhancements come from intense agricultural fires along the Indo-Gangetic Plain (IGP) north of Delhi, frequent firework festivals, and dust storms originating from the Thar Desert and Arabian Peninsula (Ghosh et al., 2014; Parkhi et al., 2016; Yadav et al., 2017; Cusworth et al., 2018; Liu et al., 2018). Like the UK, the agricultural sector is not directly regulated, and intense agricultural activity in the IGP contributes to the largest global NH3 hotspot (Warner et al., 2017; Van Damme et al., 2018; T. Wang et al., 2020).

Nigeria has the largest number of deaths due to air pollution in Africa, while the country ranks fourth for air pollution across the globe (Dianne 2019, Para1). Statistics indicate that in 2016, 150 fatalities occurred per 100,000 people as a result of this environmental issue. The State of the Global Air Report that the Health Effects Institute (HEI) published determined that Nigeria's air quality is amidst the most lethal worldwide. In Nigeria the sources include vehicle exhaust aggravated by the rising car population, industrial emission especially from petrochemical industries and cement manufacture, use of gasoline generation as a result of unstable power supply, use of fuel wood for domestic use and energy for small industries (Suleiman, 2013).

In 2016, The HEI indicated that industrialized countries like Russia and Germany have reported lower death rates than Nigeria with 62 and 22 per 100,000 people. Meanwhile, developing countries like Afghanistan, Pakistan and India have reported much higher rates with 406, 207 and 195 deaths per 100,000 people (Dianne, 2019, Para2).

1.2. The Linkage between Aerosols and Climate Change

Aerosol can influence the Earth's climate in two ways. When the sky is clear (devoid of clouds), aerosols can reflect incoming sunlight back to outer space – the direct effect (Levy II, Hiram, Larry W Horowitz, M Daniel Schwarzkopf, Yi Ming, J-C Golaz, Vaishali Naik, and V Ramaswamy, 2013).

The climate system has been as a rule firmly impacted by the inexorably escalated anthropogenic exercises since the modern unrest in the eighteenth century. During the last century, confirmations have shown huge changes in the air organization, expansion in, the World's surface air temperature, softening pace of icy masses, rise of ocean level, and so forth (Stocker et al., 2013). These progressions have affected both regular and human frameworks, and will probably influence human prosperity all the more firmly and challenge the maintainability of human social orders later on. There is a wide agreement in established researchers that an unnatural weather change is principally determined by the expanding convergence of ozone depleting substances in the environment, particularly CO2 (Stocker et al., 2013), whose fixation has expanded by around 100 ppm, or close to 33% starting around 1958. This increment in air CO2 can be ascribed to anthropogenic discharges through petroleum product copying and land use changes (Friedlingstein et al., 2019). Some aerosols, like many kinds of dust from ground-up rocks, are light-colored and even a little bit reflective. When the sun's rays beam down on them, they bounce the rays back out of the atmosphere, preventing that heat from ever reaching Earth's surface. The effect can be dramatic: The Mt. Pinatubo volcanic eruption in 1991, in the Philippines, spewed the equivalent of 1.2 square miles of tiny, reflective rock particles into the high stratosphere—cooling the planet for two full years afterward. The 1815 Tambora eruption, similarly, spawned an epic, globe-spanning "Year without a Summer" so cold and bleak it inspired Mary Shelley's dark horror novel, *Frankenstein*.

But other aerosols, like little flecks of black carbon from burned coal or wood, do the opposite, absorbing heat from the sun as it beats down. That ends up warming the atmosphere, though it cools the surface of the Earth by preventing the heat from escaping. Overall, that effect is probably smaller than the cooling most aerosols induce—but it's far from nonexistent, and the more carbon-based material that collects in the atmosphere, the more warming the atmosphere experiences.

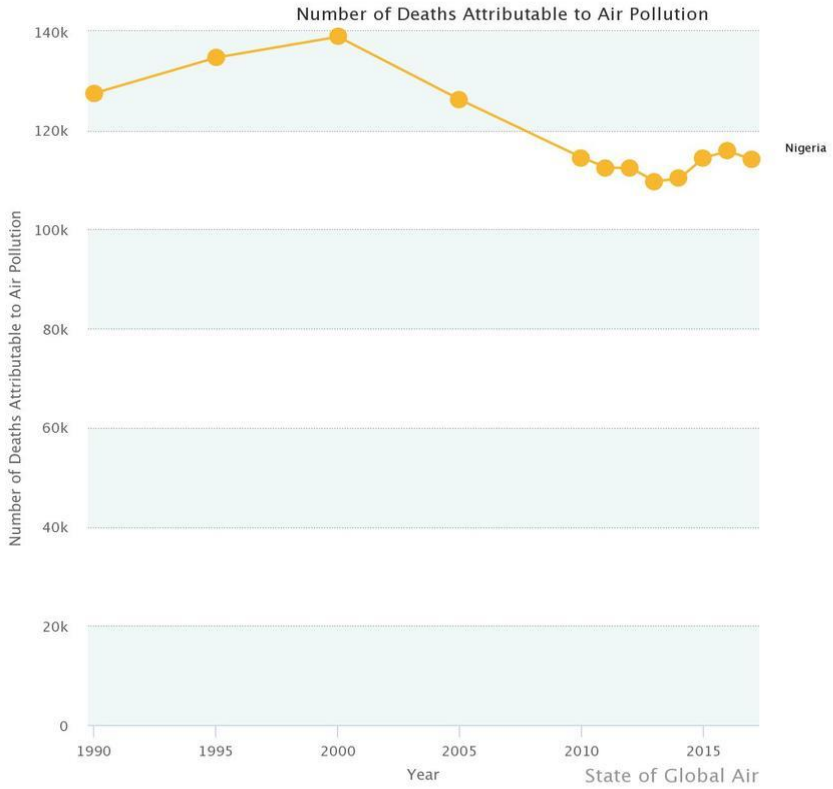
Aerosols also influence how clouds form and grow. Water droplets coalesce readily around particles, so a particle-rich atmosphere promotes cloud formation. White clouds reflect incoming sun, preventing it from getting to the surface and warming land or water—but they also absorb the heat that the planet is constantly emitting back outward, trapping it in the lower atmosphere. Depending on the cloud type and location, they can either warm their surroundings or cool them.

Aerosols have a complicated suite of different effects on the planet, but humans have directly impacted their presence, abundance, and distribution. And while the climate effects are complex, the health impacts are clear: More fine material in the air hurts human health (National geographic).

1.3. Impact of Aerosol on Human Health

Clean air is a fundamental requirement for the existence of life on earth. However, with the rapid rate of economic development, globalization, and increasing energy demand, large amount of emissions and waste are generated, leading to severe air pollution.

Figure 1. Number of Deaths Attributable to Air Pollution in Nigeria (1990-2017).



Source: Stateofglobalair.org

Another review distributed in the diary Nature Correspondences in September 2019 has found air contamination particles (dark carbons) on the fetal side of human placentas, showing that even unborn infants are not saved from openness to the dangerous particles found in air contamination. Essential wellsprings of dark carbons incorporate discharges from vehicles, charcoal and wood cook ovens. A recently distributed review (August 20, 2019) in the PLOS Science recommends a connection between openness to natural contamination, (for example, air contamination) and an increment in the pace of mental issues in both the US and Denmark - including schizophrenia, bipolar confusion and discouragement. As indicated by an as of late distributed review in the American Diary of Physiology - Lung Cell and Atomic Physiology, even low degree of air contamination openness can have an unfriendly consequence for the lungs. Scientists from Supreme School London and the Middle for Air, Environment and Energy Arrangements Carnegie Mellon College have tracked down that helpless air quality in the US might be connected with early passing and diminished future.

A developing collection of proof connections openness to air contamination to pregnancy and birth-related issues, including preterm births. Multiple million untimely births across 183 nations, principally in Africa and Asia, could be connected to air contamination, a review has found. A review distributed in the Ecological Health Viewpoints assesses that around 15,000 preterm births in the US in 2010 could be ascribed to openness to high PM2.5 poisons. Another investigation of in excess of 300,000 individuals by the European Lung Establishment has observed that air contamination speeds up maturing of the lungs and expands the danger of

creating ongoing lung sicknesses. See the review in the European Respiratory Diary here. Another review drove by the Barcelona Foundation for Worldwide Health has tracked down that openness to particulate matter (PM2.5) during pregnancy and after birth is connected with diminished major intellectual capacities, like working memory and chief consideration. Another concentrate likewise appraises that around 449,000 newborn child passing in Sub-Saharan Africa in 2015 could be connected to air contamination.

As per the World Health Association (WHO), air contamination is the biggest supporter of the best four non transferable diseases—stroke, cellular breakdown in the lungs, constant respiratory infection and heart disease—accounting for between 33% and one-fourth of those passing. It is additionally liable for half of youth pneumonia passing. Around 7,000,000 passing every year are ascribed to open air and family air contamination. The 2019 world air quality report distributed via Air Visual uncovers that Nigeria is the fifth most dirtied country in Africa, with Kano being the most contaminated city in Nigeria followed by Port Harcourt. This isn't empowering given that Nigeria is the principal African nation to set up a public institutional instrument for ecological insurance. Endeavors should be increased to further develop our air quality as breathing dirtied air kills quietly and many individuals don't know about the health chances related with air contamination.

2. Theoretical Framework

In organizing our media research on wellbeing correspondence mediations, the first is that media campaigns are for the most part motivational. They mean to design, impact or adjust the disposition of the beneficiaries. Also, there are varieties in individuals' insights about wellbeing, the causation of illnesses and suitable treatment. Thirdly, various social, socio-mental and natural elements impact individuals' view of media-arranged messages; which thusly, impact the agreeableness or in any case of medical services assets or projects. What can be gotten from the above presumptions is that they are so various to be dealt with from a solitary hypothetical point of view. This clarifies why Health Belief Model (HBM) and social ecological model (SEM) have been utilized to execute this examination. The HBM is utilized to clarify and foresee wellbeing practices by zeroing in on the mentalities and convictions of people. It is predicated on the arrangement that an individual will make a wellbeing related move, if that he or she feels that a negative ailment can be kept away from; in the event that he or she has a good assumption that by making a suggested move, he or she will keep away from a negative ailment and; in the event that he or she trusts that he or she can effectively make a suggested wellbeing move. It is based on the above suppositions that this paper, in addition to other things, inspects how individuals' response to media messages could assist them with making fundamental moves that will mitigate the threat of the large three ailments. Then again, the Social Ecological Model (SEM) sets that human conduct is affected and molded by the climate where he resides. "The model addresses a far reaching way to deal with planning, executing and assessing intercessions which focus on the various impacts on conduct". It takes insight of the mind boggling interaction between people, relationship, local area and cultural elements.

3. Communication Intervention

Nigeria’s National Environmental Standards and Regulation Enforcement Agency (NESREA) directs air quality in Nigeria through the Public Arrangement on Climate. The strategy catches sound ecological standards expected to achieve natural supportability, and features some vital methodologies to accomplishing clean air. These include:

- Designating and planning of Public Air Control Zones and announcing air quality goals for each assigned Air Control Zone.
- Establishing encompassing air quality principles and observing stations at each assigned zone.
- Licensing and enlisting of all major modern air polluters and checking their consistence with set down guidelines;
- Provision of rules for the decrease of air contamination;
- Establishing norms for the control of fuel added substances regarding minor components.
- Prescribing tough principles for the degree of outflow from vehicle debilitates and energy producing plants and stations;
- Monitoring and limiting the occurrence of "corrosive downpours"
- Promoting local collaboration pointed toward limiting the air.

While NESREA is working to achieve clean air in Nigeria with these strategies, there should be collaboration with other ministries, departments and agencies of government to implement the policy. Enforcing the National Environmental policy should not be left only for NESREA and the Ministry of Environment. The Agency should also include definite timelines for implementation of the policy in order to follow up and track achievements. Sustainable Development Goals (SDGs) 7 and 13 spotlights on reasonable and clean energy just as environment activity. Nigeria ought to foster projects to build admittance to perfect and safe family energy and further develop frameworks set up to screen air contamination. It is likewise significant that the public authority set up more air quality checking stations in Nigeria and make information on the air quality more open to Nigerians, so everybody knows about the degree of contamination they are presented to in their urban communities.

Nigeria should increase investment in renewable sources of energy, increase green spaces in urban areas, invest in cleaner cooking solutions, and provide better waste management options to prevent open burning of harmful chemicals. The country can also benefit from the Clean Household Energy Solutions Toolkit (CHEST) that WHO is developing to promote clean and safe interventions in homes. CHEST gives the tools to nations and projects to make or assess arrangements that extend clean family energy access and use. Expanded mindfulness about the wellbeing dangers of air contamination is additionally fundamental so Nigerians better comprehend the reason why they ought to stay away from hurtful air contamination rehearses. As a country we can't keep on looking as air contamination quietly kills our friends and family. We should make a move now in case we are to leave a cleaner Nigeria for our people in the future.

4. Conclusion

The primary imperatives to wellbeing correspondence intercessions could be successfully tended to if we embrace a bit by bit approach in arranging, assuming we appropriately select the interest groups and plan the overviews, and if we detail key messages that will give the best establishment to a program's prosperity. This establishment is significant in the choice, execution and testing of proper materials. At last, commitment with key clinical and required partners, just as the media, will expand positive results for wellbeing correspondence programs. Through education on the diverse impacts, mitigation measures like green energy will help reduce the effects of aerosls not only on human health but also on the environment hence conserving resources for future generation, sustainability of the natural resources shall be

embraced. Together lets reduce the use of aerosols as a measure of combating global warming and climate change.

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Life Learning Education as Way to Increase Efficiency of Employees: International and Ukrainian Company Cases

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Abstract

In the articleare described main reasons why companies have to manage employees'improvement through life learning education. We conducted analytical research using articles and sites to analyze cases of two companies, namely Nokia and Apple,with different approaches to career growth and training system for their employees. Evaluating the experience of foreign companies, we came to the conclusion that non-institutional education plays a big role today. Also, we described popular forms of improving employees' skills, its advantages and disadvantages. We conducted the research about state of development of life learning education for the private sector in Ukraine. As the result of this research we come to the conclusion that there are a lot of training centers that provide educational programs for the companies, but at the same time they are still not very popular, because companies decided that in crisis time trainings are not worth for spending money. That is false opinion, since employees and their professional qualification is the key recourse to overcome crisis period. However, employers have to remember that every department in enterprise differs from each other.So, in order to visiting trainings will have positive results, managers should know all the intricacies of each department. Then, headship will draw conclusions and create a plan of the best way of raising the level of qualification. Using such approach to professional growth of the employees in the companies will give high long term results and reflects on the company performance.

Keywords: *company, employees, training, study, improving.*

JEL Classification: *M55, M54, M51, J24.*

1. Introduction

In our days science develops rapidly, so people need to be aware in different areas in order to live normaly in modern society. "Live and learn" this saying emphasizes on studying importance during all life.So, education is necessarything, becauseif you want to achieve something or have successful career ladder you need to study a lot. However, availability of a diploma, basic knowledge after university and even good experience usually not enough. All this because our word changes, technologies are invented, countries become more develop, economics changes too, companies introduce innovations and, as a result, workers need to know how to cope with all these changes. So, the best way of improving employees' skills is trainings.

Undoubtedly, attending only courses is not enough for good team-workers, because education is a good base for work. But non-institutional education should not be underestimated. Davar and Mani Parti research work (Davar & Mani Parti, 2013) proves that workers, has a significant impact on productivity. Additionally, practice shows cases, when in prosperous companies employees with big experience and prestigious education did not cope with the task. The worth scenario of these situations can be destruction of the firm.

More and more heads of Ukrainian companies are thinking about the advisability of raising the professional level of their employees through training programs, depending on the direction of the specialty, as well as attracting young and promising personnel who can gain practical experience and become part of the company. At the same time, expenditures on staff education

had cut the first when companies have performance indicators decreased. We believe that it isn't right. Since, the high qualification of employees caused to the faster recovery of company's activity.

2. Data and methods

The study is based on foreign scientists' researches, as well as, the information from the official companies web sites both international and Ukrainian one. We used qualitative research to determine advantages and disadvantages of different forms of education for improvement employees' professional level. When we analyze cases of foreign companies to understand the importance of constantly education of employees we use methods of descriptive research. To make conclusions and suggestions for the companies about importance of life learning education we have done analytical research. In the process of preparing the article used the following methods were used: system-structural (to analyze different forms of education programs for life learning of employees), abstract-logical (to make suggestions to the companies about importance of life learning education for their high performance, especially in crisis periods), deduction (to make a conclusion on the basis of research the state of life learning education in Ukraine), induction (to make a conclusion on the bases of cases of foreign companies.

3. Results and Discussion

Today we have a big range of courses, trainings and different non-institutional education. It is lectures, role playing, case studies, group discussion,coaching or mentoring. Let's consider more these popular forms of education that can be used in life learning education to improve professional level of company's employees.

Lectures are important for getting theoretical knowledge to a large number of employees. It is not very expensive in money and time for company. For this type of training can be used video, audio, presentation and oral materials. Drawback of this method is it only one way communication. The main disadvantage is trainees cannot give feedback (Rabiyathul, Basariya, VasanthiSree, 2019) Hence, as practice shows, it is the least effective method, because people use near 20% of new information or even do not use it at all (Mostenska, T., Ralko,O., 2015).

Role playing asks employees to work through one aspect of their job in a controlled scenario. It is high effective method, because workers can interact with each other, study at their mistakes. Thus, this type of activity is good for preparing communication in different social situations, developing basic interaction skills and it provides a kind of certain experience. Nevertheless, it may be unnecessary for simple, straightforward topics and a role that learners perform sometimes have not in real life. Additionally, Vannak said that "Role playing is an activity for interacting, but not for acting." (Vannak, 2013). That is this type of training system more suitable for improving team work.

Case study can provide a quick way for employees to learn about real workplace issues. It is a great option for focused topics.As compared to other methods, the case method allows the trainee to assimilatebetter what was taught because the relevance of the information becomes more realistic when people learn through case studies. It should be noted that the case study method is very useful when it comes to imbibing a sense of team spirit. Although, not all employees can perceive information from such method, because it requires form them existence of huge theoretical basis to find the right ways for case solving. Furthermore, as research on case study method shows that the drawback is the amount of time it could consume, realistic cases are rare and difficult to pen. It also requires that the trainer is very creative and knows how to steer the discussion the right way (Shivakumar, 2012).

Group discussion and activities allows multiple employees to train at once, in an environment that better fits their current departments or groups. This type of employee training is best used for challenges that require a collaborative approach to complex issues. It is also good for setting-up team interaction via exchanging of experience and knowledge. However, it can be difficult to involve everyone to discussion. In addition, this method concentrated more on theory, so for greater efficiency it should be used in conjunction with practical activities.

Coaching or mentoring focuses on the relationship between an employee and a more experienced professional, such as their supervisor, a coach, or a veteran employee. The one-on-one mentoring style creates a relationship between employees that carries far beyond training. It also allows the employee to ask questions they may not feel comfortable asking in a workplace, during study or instructor-led training. This training method can be done in person or virtually, through online coaching sessions. Coachingcan sometimes takes a big amount of time and considerable costs.

All these forms of education can give good results in the system. But practice sometimes does not show any changes after trainings. Additionally, a lot of employers neglected to create training courses specifically for their staff. They simply send workers to courses without even paying attention to the importance and reliance of the topic to the personal employee needs. Hence, we can see that staff do not interested in additional education. To find a solution of this issue, superiors should understand that they need to do special process. Based on Eduardo Salas study (Salas, Tannenbaum, Kraiger, Smith-jentsch, 2021), there are some strategies for maximizing quality results of trainings: training analysis, the learning and preparing climate, the creating of schedule, establish attendance policies, encourage to the use new knowledge in practice.That is in order to avoid this situation, managers have to analyze all types of trainings, determine what exactly employees need to learn, encourage them to improve their skills, explainimportance of it and find person who can effective provide study.

To confirm the necessity of additional trainings let us consider an example of international corporation Nokia. The company achieved its pinnacle of success in the end of 1990s and in early 2000s, but bytheend of 2000s it loosed its high position.

The main reason of Nokia's falling, in our point of view, was unlimited career growth in managerial path. The promotion was obtained for years of service. For example, three years of work and engineer could become senior engineer, three more – a specialist, etc. Promotions within the same organization tended to occur in accordance with the amount of time worked, and who had not been promoted to the position of manager just were waiting for promotion. On the one hand, availability of career growth was a good stimulation for employees to work for Nokia. On the other hand, this way played a cruel joke with company.

A positive instance of improving personnel skills is an American technology company Apple. Company management is interested in pushing and promotion employees. Apple does it in the best way. Instead of sending staff to unknown trainings, the head of the company decided to create Apple University (article from the Internet, 2021). It is completely free and duration of study one year. Personnel can combine study and work for company without problems. The system of study provides lectures given by teachers of leading educational institutions in the United States and practice tasks, which directly connected with type of company activity. However, detailed curriculum is classified. After these course personnel has an opportunity to achieve a success in career.

As mentioned earlier, providing employees with career growth is undoubtedly a big advantage. Nevertheless, each higher position needs more and more knowledge, so in order to receive them workers need regular update their qualifications. But Nokia's superintendent did not follow this simple strategy and we can see the next results.

By the end of 2000s Nokia corporation had administrative team, which did not know market demand, was not able to do normal analytics work, supportof thecompany's strategy and even

make rational decisions. As a result, Nokia spent an enormous amount of money for unnecessary operations, which sometimes were not even completed, unprofitable investments and contracts. Besides, the biggest failures were the loss of reputation, lack of current supply of goods and a large number of unnecessary overbought companies. The reason was luck of knowledge, skills and absence of practice in managerial sphere. In this case, headofcompanyhadtothink about ways how to improve staff competence, adapt special training for company's activities and maybe to install a limit for promotions.

From the other hand, Apple is the world's largest company in the field of information technology in terms of revenue and in 2018 the company became the most expensive public company in history. As we can suggest, these achievements are made thanks to highly skilled workers. Not in vain, the company interested in non-institutional education and investing in it. As a result of additional activities, Apple have people, who realizes the main company strategy and understands what to produce, who knows trends in the market, who learned and worked out new techniques. Also, managers can customize study program according to changes, which can happen in the world.

Of course, lack of properly building system of improving personnel's qualification level isn't the only reason for the described companies. But we strongly believe that each company step depends on the level of its management stuff. Since, at the end every result of company activity it's the result of decision making of its managers. And company future depends on the ability of strategically thinking, open-minding, personal efficiency of the employees. To maintain the high level of this skill for the long term we as a company need to implement life learning education adopted the company needs.

With the aim to investigate life learning education and its essence for business development let's focus on Ukrainian educational market.

In our opinion, the market of educational and training centers can be conditionally divided into three categories: training centers under well-known international and domestic commercial companies; training centers at universities; training centers as an independent type of business, specializing in the development and delivery of trainings, both individual and corporate order, mainly on business topics and personal self-development.

Moreover, the opening of training programs, internship programs and training centers with already well-known commercial companies, in our opinion, usually occurs with the main goal of finding and attracting talented young people to the company's staff; on a paid basis. For higher educational institutions, this is one of the ways to provide related services related to the main activities of institutions and, if properly organized, meet the demand for educational services of a wide range of consumers and receive an additional source of income.

Let's move to the market of educational and training centers in Ukraine. Today in Ukraine there are more than 1390 training centers from various fields of professional activity (Demographic and social statistics, 2021). Having researched and analyzed potential competitors in the Ukrainian market, we identified the more popular ones.

Training Center "Leader" is a vigorously developing company in the field of modern educational technologies. The company has successfully united professionals in their field, convinced adherents of the thesis about the prevalence of practical experience over theoretical knowledge (Mostenska & Ralko, 2015). Training center "Leader" refers to training centers as an independent type of business, specializing in the development and delivery of trainings for both individual and corporate orders, mainly on business topics and personal self-development.

The mission of the company is to significantly improve the quality of society life; the training center helps to develop such qualities as a sense of responsibility, communication skills, and leadership skills.

The main goal of the center is to help each participant get what they want, teach them to achieve high results in life, as well as help listeners turn weaknesses into strengths, which will contribute to conquering new heights.

Specialization of the training center is sales, business negotiations, communication with the client, public speaking, company management, personal growth.

Consider educational and training centers functioning as divisions or separate areas of companies and operating on the Ukrainian market.

Cisco Academy conducts Cisco-authorized CCNA training workshops, prepares professionals for the implementation of highly intelligent projects in the field of information technology (CiscoAcademy, 2021).

A distinctive feature of the Cisco Academy is that here, in a short time, participants can gain both fundamental knowledge and practical experience in administering equipment.

After completing these courses, participants can design, install, configure and operate both small computer networks and networks of large enterprises and Internet providers. The learning process at Cisco courses follows the principle of a gradual transition from simple to complex, individually for each student, which makes it as comfortable and effective as possible.

The DEPS Company on an ongoing basis conducts refresher courses for specialists in the field of telecommunications and information systems (DEPS, 2021).

DEPS teaches IT specialists taking into account the global trends in the development of infocommunication systems and the modern needs of the telecommunications market. The trainers of the technical directions of the training center give students unique technological knowledge and practical skills, which in the future helps graduates to get a job in leading IT companies in Ukraine, Eastern, Central and Western Europe or to move up the career ladder.

The Lviv Chocolate Workshop Training Center (Chocolate Workshop Training Center, 2021) was created as a place where all employees can actively learn and develop, and it is also a good platform for exchanging views, communicating, and jointly solving problems. All educational and development programs are designed not only to transfer pure theoretical knowledge but alsopractical tasks and exercises on group cohesion. That is why training at the Training Center is as interactive as possible; trainers are successful practitioners who have worked in different areas of the Company from the very beginning of its creation.

When we take a look at the dynamics of using different educational programs by Ukrainian enterprises, we can conclude, that they only have started to understand its importance. A lot of training centers conclude that the biggest part of their clients is individuals rather than corporate sector. But further development of systematic corporate education to ensure high level of personal efficiency is our future with no doubt.

Organizations today need to constantly adapt and change to thrive in an environment of continuous innovation and change. Having a great team, the right strategy, and well thought out processes is not enough. The company needs technologies that can help connect data, processes and people to better interact with consumers in the digital age and adapt more quickly to the changing environment.

Therefore, in our opinion, for companies with significant experience in the market, a successful solution would be to develop and open a specific training program, which will allow it to receive in the future both a highly qualified specialist and improve the work of a permanent staff. If the company does not have significant experience in the market or is not interested in investing in non-core activities for itself, you can contact professional training centers that work both independently and at educational institutions.

4. Conclusion

The dynamic nature of modern life puts ever higher demands on the professional qualities of workers. Accordingly, in order to maintain professionalism at a competitive level, it is necessary to constantly take care of one's educational potential.

Personnel training are a continuous process of preparing employees for labor and social activities. Scientific and technological progress, like all spheres of public production, constantly requires an increase in professionalism and a systematic configuration of the content and technology of labor. The faster the industry develops, the faster scientific and applied knowledge grows old, and the need for new ones also appears.

Summing up, we want to note that an implementation of trainings gives a lot of benefits for company. So, after non-institution education enterprisereceives people, who is ready to work on new position, who knows different innovations in current sphere, works more effective and productive, is able to cope with harder tasks, can work with last technologiesandspread them between colleges.

Although, we often see that employees do not want to take part in trainings. They think all this courses just wasting time, money and in some cases it is right statement. Therefore, instead of forcing staff to visit any extra-educational programs, employers should take a responsible approach to this issue. Our study showed what results can be obtained if you make maximum effort to develop employees.

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The Use of Intelligent Technologies in Solving Transport Problems

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Abstract

Development of optimal routes for transportation of goods from the point of departure to the point of acceptance helps to accurately determine the required number of cars, transportation time, transportation costs, also helps to reduce downtime, efficient use of rolling stock.

The structure of the neural network for solving the transport problem is considered. Methods of training and optimization of the neural network are analyzed. Intelligent technologies allow you to quickly find more accurate solutions to various transport problems.

The research results can be used by analytical departments of transport enterprises, individual transport companies, transport departments of industries, educational institutions for the study of transport logistics to solve routing problems and find the optimal route of transportation.

Keywords: *Transport, neural networks, transport, artificial intelligence.*

1. Introduction

The logistics industry is one of the leading sectors of the world economy. The concept of logistics means the management, distribution, direction of material or information flows from sender to recipient. The success of logistics in the market depends on how developed the direction of logistics is.

Transport logistics means managing the movement of material resources in time and space according to the needs of the consumer. In other words, transport logistics is responsible for delivering goods from sender to recipient on time and reliably. Vehicles and the route they follow are an integral part of the logistics process. The choice of vehicles depends on the type of goods delivered, the distance of transportation. But the choice of transportation route is a more difficult problem for the logistics department. It depends on many factors, including distance, condition of the road surface, weather conditions (fog, ice, rain, wind), the presence of settlements on the way and so on. Among the factors that affect the time of delivery there is also a human factor - the mood of the driver or forwarder, the interaction of the driver with the forwarder and so on.

The relevance of this work is that the development of optimal routes for transportation of goods from production to end users helps to accurately determine the required number of cars, transportation time, transportation costs, also reduces downtime, efficient use of rolling stock. If you use the most optimal routes, the production costs can be reduced by 1.5-2 times.

Thus, the development of efficient transportation projects will contribute to the timely and uninterrupted delivery of products and effective interaction of the supplier with the consumer.

Unfortunately, there is currently no single optimal method of improving the transportation route under the given conditions. Existing optimization methods are not ideal. Some are simple and unreliable, some are difficult to implement in the presence of a large number of factors that affect the result, some are difficult to implement and require expensive information support.

Therefore, the aim of the study is to develop a method of choosing the optimal route taking into account the influence of factors such as weather conditions, day of the week, time of day, condition of the road surface, the presence of residential complexes and cottages on the way.

To achieve this goal the following tasks are set:

- development of a mathematical model and determination of model parameters;
- development of a general optimization method;
- network optimization;
- verification of the efficiency of the method.

To optimize the route, artificial neural networks are used, which are trained using information about previously performed flights. Artificial neural network training can take place with the help of various software: C ++, MatLab, NeuralBase and others. In this paper, MatLab application software is selected for the creation and training of neural networks.

2. Data and Methods

An important component of solving the optimization problem is an intelligent decision-making system based on a simulation mathematical model. A system of this type should evaluate the time of execution of the task in specific conditions by a particular executor. The simplest in this case is the calculation of the time of transportation of goods, which is calculated based on the length of the route and the average speed of the car, as well as the time of operations by the forwarder. However, such calculations often do not meet the expected results, because they do not take into account the influence of external factors (Ruslan Stepanov, 2021).

Optimization of the transportation route can be done using various methods described. Each of them has its advantages and disadvantages, but is not universal, because they do not always take into account external factors. That is why the use of the neural network method was chosen to optimize the delivery route. When forecasting transportation time, the system should take into account seasonality, day of the week, time of day. It is also necessary to take into account the influence of personal characteristics of the driver and forwarder (temperament) on the final result: the driver on the speed of the car; freight forwarder at the time of receipt and transfer of goods; the influence of team members on each other (Ruslan Stepanov, 2021).

2.1. Factors that affect the time of delivery of goods

Time for delivery of cargo is calculated as the time of the beginning of work of the forwarder on acceptance for registration of cargo before the moment of full delivery of cargo to the recipient.

Factors that affect the delivery time can be divided into two groups:

- own flight performance;
- cargo maintenance work.

The first group of factors includes:

- condition of the road surface;
- road characteristics (number of lanes for traffic, speed limits, the possibility of people or animals on the road);
- the presence of settlements on the way;
- seasonal / weather conditions;
- features of performance of work by the driver in various situations.

The second group of factors includes:

- features of the organization of the process of loading and unloading works;
- features of the documentation procedure;
- features of the cargo acceptance-transfer process;
- the role of the freight forwarder in the performance of works;

– features of performance of work by the concrete forwarder.

Among the above factors, the following flight data should be included in the database of any freight forwarding company:

– flight departure date D;
– departure time t;
– the time spent on the flight as a whole T_{run}.

In addition, as a rule, the time for the flight in normal conditions T_{drv}^{avg}, as well as the standard time for the operations of acceptance and delivery of goods by the forwarder T_{frv}^{avg}avg.

It should be noted that some factors that affect the difference in the time of the route under normal conditions T_{drv}^{avg}avg and the real time of the route do not depend on the date of the trip, but on the day of the week, season and specific time of day (congestion, ice, the required number of staff in warehouses for delivery and acceptance of goods, etc.). With this in mind, the date of delivery must be converted into the number of days (formula 1) depending on, for example, the beginning of the year $D \rightarrow Day_{yr}$ and the day of the week that corresponds to this date:

$$Day_{week} = mod\left(Day_{yr} - Day_{fs\_mn}, 7\right) + 1 \quad (1)$$

where $mod()$ - is a function that returns the remainder of the division of numbers;

Day_{fs_mn} - the number of the first Monday of the year (if the beginning of the year falls on a Monday, then Monday is the first day).

2.2. Simulation mathematical model of the cargo delivery process

To solve any problem using the method of neural networks, it must be taught in advance on the prepared examples. In the process, there is a gradual substitution of the parameters of all coefficients of neurons in the network.

Training takes place using two data sets: training and control. Based on the results of the network, the value of the parameter Z is calculated, which characterizes how close the initial value of the network is to the specified one. Initially, the values for both sets decrease. However, at some point the value of the parameter Z for the control set (ZC) begins to increase, and for the training (ZT) continues to decrease. In this case, we can talk about retraining the network, which means that the network has too complex a structure. In this case, it should be simplified and retrained. To check the operation of the network it is necessary to determine the accuracy factor.

2.2.1. The general structure of the model

The developed model is based on the Monte Carlo method. This method means a numerical method for solving various problems by modeling random variables.

Execution time is generally calculated by formula 2:

$$\widehat{T_{run}} = \widehat{T_{drv}} + \widehat{T_{frv}} \quad (2)$$

where $\hat{*}$ - is a sign of a random variable that has a given distribution law;

$\widehat{T_{drv}}, \widehat{T_{frv}}$ - random lengths of the route and time to perform tasks by the forwarder.

The length of the route is modeled by formula 3:

$$\widehat{T_{drv}} = T_{drv}^{avg} \cdot \widehat{k_{drv}} \cdot \widehat{k_{drr}} \quad (3)$$

where $\widehat{k_{drv}}$ - coefficient determined by objective factors influencing the route;

$\widehat{k_{drr}}$ - is a coefficient that is determined by subjective factors that affect the route.

The value $\widehat{k_{drv}}$ depending on the problems solved with this model can be expressed in different ways. If it is necessary to simulate the transportation of goods on a specific given route (routes), the coefficient $\widehat{k_{drv}}$ can be calculated by formula 4:

$$\widehat{k_{drv}} = \widehat{k_{drv}^{rd}} \cdot \widehat{k_{drv}^{twyd}} \cdot \widehat{k_{drv}^{rds}} \quad (4)$$

where $\widehat{k_{drv}^{rd}}$ - coefficient, which is determined depending on the road on which the route passes (depends on speed limits, quality of coverage, etc.);

$\widehat{k_{drv}^{twyd}}$ - coefficient, which is determined depending on the specific hour of the route, day of the week, day of the year (presence of congestion, reduction of the maximum allowable speed, etc.);

$\widehat{k_{drv}^{rds}}$ - coefficient, which is determined according to the characteristics of the route depending on the season (ice, wet surface, fallen leaves, blizzard, etc.).

It should be noted that the coefficients $\widehat{k_{drv}^{twyd}}$ and $\widehat{k_{drv}^{rds}}$, taking into account their effect on the delivery time, must be equal to or greater than one.

The value of the coefficient $\widehat{k_{drr}}$ is calculated by formula 5:

$$\widehat{k_{drr}} = \widehat{k_{ds}} \cdot \widehat{k_{dı}} \quad (5)$$

where $\widehat{k_{ds}}$ - coefficient that depends on the driver's skills (driving style, ability to independently find a way out of a critical situation, find and solve technical problems with the car, etc.);

$\widehat{k_{dı}}$ - coefficient that depends on the mental state of the driver (problems in the family, at work, the impact on the driver of the freight forwarder during the trip, etc.);

The value of the parameter $\widehat{T_{frv}}$ should be calculated by formula 6:

$$\widehat{T_{frv}} = T_{frv}^{avg} \cdot \widehat{k_{fs}} \cdot \widehat{k_{frv}^{twyd}} \cdot \widehat{k_{frv}^{ds}} \cdot \widehat{k_{fı}}, \quad (6)$$

where $\widehat{k_{fs}}$ - coefficient that depends on the skills of the freight forwarder (experience and style of work, etc.);

$\widehat{k_{frv}^{twyd}}$ - coefficient, which is determined depending on the features and conditions of work at a particular time, day of the week and day of the year (availability and availability of personnel, equipment for loading and unloading, etc.);

$\widehat{k_{frv}^{ds}}$ - coefficient that depends on the characteristics of work on a particular business entity;

$\widehat{k_{fı}}$ - coefficient that depends on the psycho-emotional state of the freight forwarder (conflicts in the family or at work, relations with the driver, etc.).

2.2.2. An example of the implementation of a simulation mathematical model of the cargo transportation process

For an example of realization of the offered approach the model of delivery of freight on 4 routes for one pair the driver-forwarder is developed. Characteristics of roads and delivery time for each route are given in table 1.

Table 1. Characteristics of roads and route time

Characteristics of the route	Transportation time in ideal conditions T_{drv}^{avg}, h
Short with a broken coating	1,5
Short, through residential complexes	1,5
Medium, speed limit and availability of cottages	2
Long, good coverage, no residential complexes and cottages	2,5

Source: developed by the author.

For all variants the time of performance of operations on acceptance, delivery, registration of cargo by the forwarder is accepted $T_{frv}^{avg} = 0{,}5$ hours.

The time of departure on the route is modeled according to the uniform law in the range from 0 to 24 hours.

The value of all coefficients is calculated by formula 7:

$$\widehat{k_\iota} = 1 + \Delta\widehat{k_\iota} \quad (7)$$

where $\Delta\widehat{k_\iota}$ is a random parameter that determines the difference from the unit of the i-th coefficient. All values of $\Delta\widehat{k_\iota}$ were obtained using the method of expert evaluations.

One pair of freight forwarders works on all 4 routes. It employs two people close in temperament to phlegmatics. Temperament is a dynamic characteristic of mental processes and behavior of a person, which is manifested in their speed, variability and other qualities (Herbert W. Helm Jr, 1980). Phlegmatic is characterized as a calm, reserved, sometimes slow, with a constant mood. Phlegmatics weakly express their mood outside. Have a strong, balanced, inert type of nervous system. Such people have a reliable memory, their decisions are well thought out, balanced and risk-free. They notice small details, always achieve the result due to stubbornness. Phlegmatics are dominated by a calm mood. Phlegmatics are not prone to conflict, have excellent endurance, calm, sometimes even indifferent to others. The phlegmatic-phlegmatic couple interacts well with each other, because their temperaments and characters are calm and balanced (Herbert W. Helm Jr, 1980).

From these data, we can conclude that the phlegmatic-phlegmatic pair will have minimal or even no effect on each other's work. Therefore, for such a pair, the mathematical expectation of parameters that characterizes the skills of work depending on the influence on each other $M\left(\Delta\widehat{k_{ds}}\right) = M\left(\Delta\widehat{k_{fs}}\right) = 0$, standard deviation $S\left(\Delta\widehat{k_{ds}}\right) = S(\Delta\widehat{k_{fs}}) = 0{,}08$. The standard deviation characterizes the changes in work skills depending on the relationship between driver and freight forwarder during work. Coefficients that depend on the psychological state, problems in the family, mood also change under the influence of each other. Based on this, we take $M\left(\Delta\widehat{k_{d\iota}}\right) = M\left(\Delta\widehat{k_{f\iota}}\right) = 0,\ S\left(\Delta\widehat{k_{d\iota}}\right) = S\left(\Delta\widehat{k_{f\iota}}\right) = 0{,}03$.

The moment of entering the zone of possible congestion is calculated by the formula 8:

$$t_b = t + \frac{T_{drv}^{avg}}{2} \quad (8)$$

Peak hours are taken in the morning 08: 00-09: 00, in the evening 18: 00-20: 00. Moreover, the most intense traffic jams are in the evening, when most people return home after work (Joël Meissonnier & Cyprien Richer, 2021).

The main task of the study is to determine which route is the most optimal for the transportation of goods according to the time of day, day of the week and day of the year. The following transportation options have been identified for this purpose (Table 2).

Table 2. Transportation options on four routes

- winter, weekdays, 8: 00-9: 00;	**- summer, weekdays, 8: 00-9: 00;**
- winter, weekdays, 9: 00-18: 00;	**- summer, weekdays, 9: 00-18: 00;**
- winter, weekdays, 18: 00-20: 00;	**- summer, weekdays, 18: 00-20: 00;**
- winter, weekdays, 20: 00-8: 00;	**- summer, weekdays, 20: 00-8: 00;**
- winter, Friday, 08:00 to 09:00	**- summer, Friday, 08:00 to 09:00**
- winter, Friday, 09:00 to 18:00	**- summer, Friday, 09:00 to 18:00**
- winter, Friday, 18:00 to 20:00	**- summer, Friday, 18:00 to 20:00**
- winter, Friday, 20:00 to 08:00	**- summer, Friday, 20:00 to 08:00**
- winter, Saturday, 8: 00-9: 00;	**- summer, Saturday, 8: 00-9: 00;**

- winter, Saturday, 9: 00-18: 00;	**- summer, Saturday, 9: 00-18: 00;**
- winter, Saturday, 18: 00-20: 00;	**- summer, Saturday, 18: 00-20: 00;**
- winter, Saturday, 20: 00-8: 00;	**- summer, Saturday, 20: 00-8: 00;**
- winter, Sunday, 8: 00-9: 00;	**- summer, Sunday, 8: 00-9: 00;**
- winter, Sunday, 9: 00-18: 00;	**- summer, Sunday, 9: 00-18: 00;**
- winter, Sunday, 18: 00-20: 00;	**- summer, Sunday, 18: 00-20: 00;**
- winter, Sunday, 20: 00-8: 00;	**- summer, Sunday, 20: 00-8: 00.**

Source: developed by the author.

The use of this model is possible for the analysis and optimization of the transport enterprise. Possible factors that affect the final result may be changes in the work schedule, the formation of new groups of employees according to the criteria of psychological compatibility, training of individual employees, etc.

Simulation of the simulation model takes place in the Matlab environment. The simulation results are shown in Fig. 1 The red line on the graphs shows the training sample, the blue - the control sample.

As can be seen from the results, the obtained model is quite sensitive to external factors and even allows to assess the influence of the human factor. To use this mathematical simulation model, it is further planned to optimize it using neural networks.

The use of this model is possible for the analysis and optimization of the transport enterprise. Possible factors that affect the final result may be changes in the work schedule, the formation of new groups of employees according to the criteria of psychological compatibility, training of individual employees, etc.

2.3. Creation and optimization of a neural network for forecasting the execution time of a transport task

The method of optimizing the transportation route is to train the neural network of the selected type using a training data set. Therefore, it is necessary to build a neural network and teach it.

At the entrance, the neural network will receive data on the route of transportation: the time of transportation, which route is used, who is the driver and forwarder, the condition of the road surface, and so on. At the exit of the neural network is expected to get the transportation time for each route, taking into account the influence of all factors.

To achieve this goal the following tasks are set:

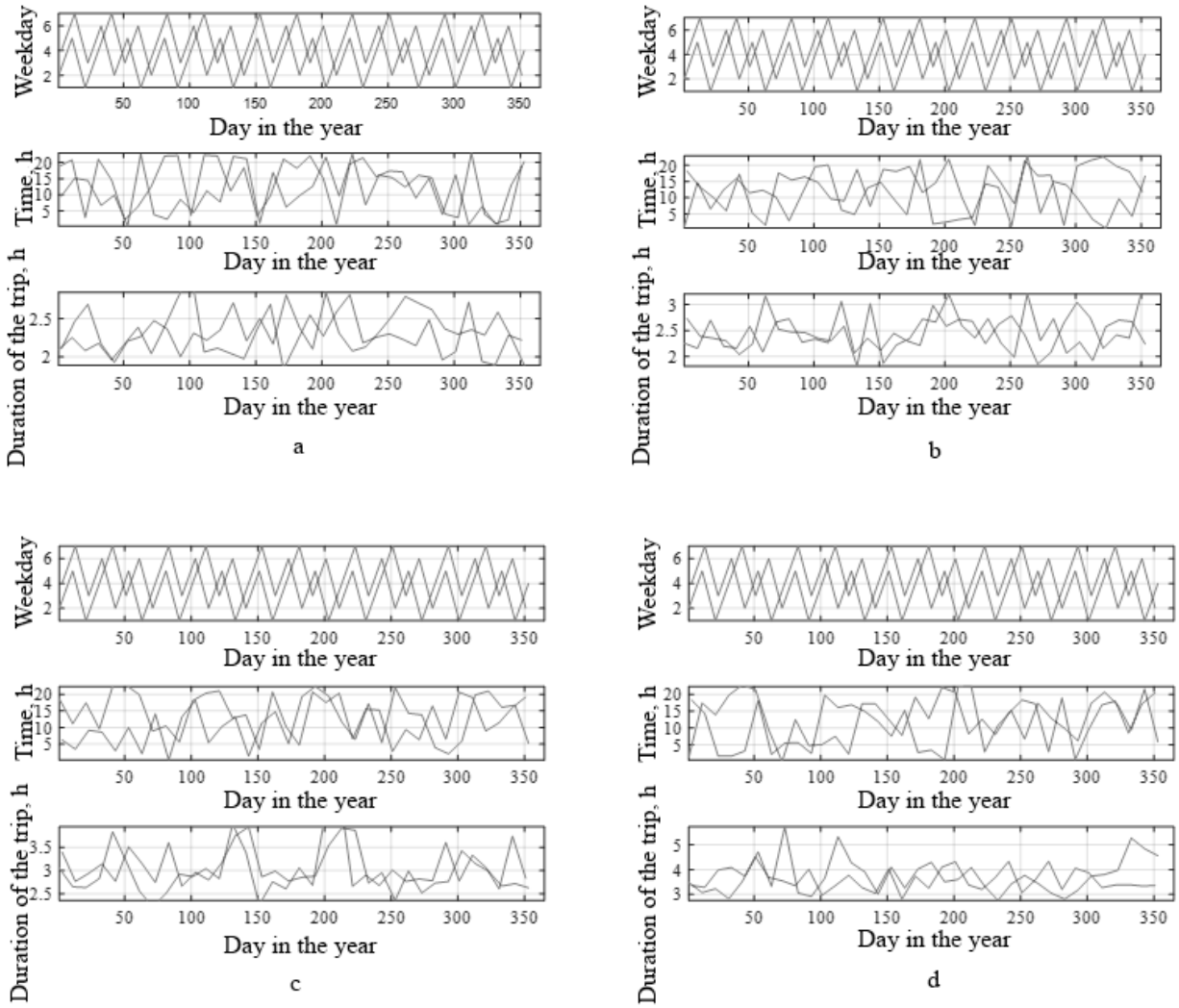
– development of a method for determining the optimal activation functions to solve this problem;
– development of a method for assessing the optimal training and control sample, which would sufficiently fully characterize the working process of cargo transportation;
– development of a method for optimizing the number of layers and the number of neurons in them.

The criterion for the quality of a certain sample of data is the accuracy of the network, which is determined by formula 9:

$$\Delta t_{\text{т}} = \sqrt{\frac{\sum(t_{\text{к}} - t_{\text{н}})^2}{z}}) \text{ (min)} \quad (9)$$

where z - is the number of studies.

Figure 1. Flight time on routes according to the day of the year: a - on the first route; b - on another route; c - on the third route; d - on the fourth route



Source: developed by the author.

The neural network is simulated in a suite of applications for solving Matlab technical calculations (version R2015b).

At the optimization stage, the neural network may be simpler in structure. The experiment is performed with a two-layer neural network, the number of neurons at the input gradually increases from the minimum value until there is a retraining of the neural network. In this case, we choose the optimal number - 12 neurons (ie network training occurs 11 times, from one neuron on the first layer to 12 neurons on the first layer). The output layer will always have one neuron. The parameter of quality of work of a control set $\delta^{к}$ which the investigated network can reach is estimated. To determine $\delta^{к}_{min}$ it is necessary to conduct training several times. The average value of $\delta^{к}$ is taken as the optimal $\delta^{к}$. Training and control sets are accepted maximum, 365 points.

After determining the optimal number of layers and neurons in the neural network, it is necessary to determine the minimum value of $\delta^{к}$ which can reach this network. For this purpose, this two-layer neural network was studied 7 times during 70 epochs.

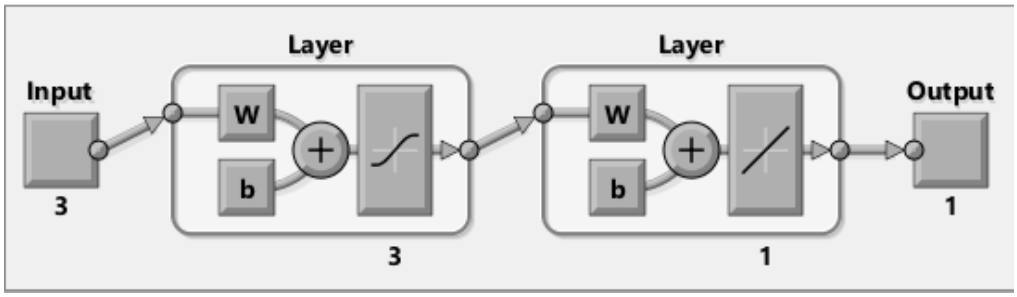
Therefore, it is determined that the optimal for use is a two-layer neural network with the maximum training and control set. With such sets, errors are minimal. On the first layer we use

3 neurons. Training is conducted over 70 epochs. As can be seen from Fig. 3.13, this number of epochs is optimal, because, approximately, after the 20th epoch, learning stops, but it is necessary to take into account the possibility of sudden nets and choose the number of epochs greater. The best learning outcomes for each route are stored in the network and used later to predict transportation times.

3. Results and Discussion

The optimal neural network for performing the task of optimizing the transportation route is shown in Fig. 2. on the first layer we see the hyperbolic tangential activation function 'tansig', on the second - the linear transfer function 'purelin'.

Figure 2. The final two-layer neural network with three neurons on the first layer



Source: developed by the author.

The best learning results of the network are preserved. A separate data matrix is built for each route, which contains data on different transportation options: day of the year, day of the week, time of day. The matrix, based on the data in table 2.2.2.1, has the following form (Table 3):

Table 3. Data matrix for the first route

Day of the year															
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Weekday															
4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7
Time of day															
8:30	14:30	19:00	1:00	8:30	14:30	19:00	1:00	8:30	14:30	19:00	1:00	8:30	14:30	19:00	1:00
Day of the year															
180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Weekday															
4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7
Time of day															
8:30	14:30	19:00	1:00	8:30	14:30	19:00	1:00	8:30	14:30	19:00	1:00	8:30	14:30	19:00	1:00

Source: developed by the author.

Table 3 shows the results of the study for each route separately.
The developed optimization method is based on the use of simulation mathematical model of transportation route optimization. Next, training and control samples are formed to determine the minimum training set that can be considered optimal. Neural network training made it possible to determine the optimal transportation routes for each case depending on the day of the week, season and time of day.

So, as can be seen from Figures, according to the results of research, the best winter on Thursday will be route number 3 during rush hours and at night, and during the day - route number 1. This is due to the fact that in winter the third route has no congestion, because country settlements nobody visits. The road at this time is usually free.

On Fridays in winter, route number 1 will be optimal for rush hours. The road is broken, so most drivers bypass it and there are no traffic jams even at the busiest times. Day and night, between rush hours, route number 2 is optimal, because residents of residential complexes that occur on the road, as a rule, are working at this time.

In winter, on Saturday and Sunday at any time of day, the best route is number 2. The road is well covered, residents of residential complexes at home or on vacation, cars on the road almost no.

The situation is different in the summer. On Thursday during rush hours and in the afternoon, route number 1 is the best. This is due to the fact that the second and third routes are very busy. At first because of the large number of people who go to work, from work. On the third because in the summer a lot of people come to the country. However, at night the best option would be route number 2, because it is the best road and there are no traffic jams.

Friday's score is similar to Thursday's. When the second route is congested during rush hour, it is recommended to use route number 1. When there are no traffic jams - day and night - route number 2 is best.

On weekends, the most optimal route is number 2. It has a good road surface, at the entrance residents of residential complexes are in the country or on vacation, so there are no traffic jams.

The third route is not considered in the summer, because residents come to the country settlements and the road is full.

The fourth route under normal conditions takes 2 hours and 30 minutes. The speed here is unlimited, because on the way there are no settlements or residential complexes. Because of this, ice causes great damage in winter. Drivers are forced to reduce speed to avoid an accident. In summer, there are shorter options that can be followed by the driver.

4. Conclusion

1. A mathematical model is developed and its parameters are determined. Optimization of the transportation route is possible by developing a mathematical model of transportation taking into account the influence of external factors. Thus, a stochastic, static, discrete-continuous, imaginary mathematically simulation model is developed.

The initial information for this model is information about the flights of the transport company, namely: route, date and time of departure, time of transportation and execution of necessary processes by the forwarder under ideal conditions, real time of all operations, driver and forwarder identification numbers.

During the development of the model, the parameters that affect the final result were also set. These are, first of all, weather conditions, the condition of the road surface, the presence of settlements on the way, the presence of speed limits.

The developed model is based on the Monte Carlo method, and the influence of external factors is determined using the method of expert assessments.

2. The general method of optimization of a route of transportation is developed. The method consists in learning a neural network with direct data transmission using a training data set. This type of network is chosen because it is best suited for optimization tasks. Training takes place with the teacher, because at the beginning the network receives all the necessary data to perform operations, including the final time of transportation. The method of teaching Levenberg-Marquardt is chosen. As a function of activation functions in this neural network, a nonlinear function is selected at the input, and a linear activation function is selected at the output.
The general method of optimization allowed to determine the dependence of transportation time in accordance with the time of day, day of the year, day of the week. However, its end result is not complete, so it was decided to optimize the neural network to get the best transportation time.

3. Optimization of the neural network allowed to simplify the structure of the network and get a concrete result.

4. To use the neural network, a data matrix was built for each possible case of transportation, taking into account the time of day, day of the week, day of the year. Based on the results of the neural network training, the most optimal transportation routes for each specific case were selected.

The obtained research results are logical, real and can be used in practice. Consequently, the developed method of optimizing the route of transportation can be considered effective and used in practice in transport companies, universities, industries with its own fleet.

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Features of Import and Export Operations in a COVID-19 Pandemic.

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Abstract

The article is devoted to the research of the peculiarities of the development of measures against COVID-19 pandemic within export-import activities. The purpose of the research is to describe main restrictions and support measures related to the economy and security, represent and study the situation with Ukrainian import and export activities in the period from 2020 to 2021, the discrepancies between them and the actions that were taken to achieve a satisfactory result. The analysis of the xport-import operation was performed using topic-related websites of State Statistics Service of Ukraine, which represent official statistics and contains information on types of activities in the context of goods, trade volumes and costoms codes. Empirical studies, data analysis and synthesis, expert assessments, and generalization methods were used to perform the scientific inquiry. The import and export conditions and different way to improve foreign economic activity related to countries, that are trying to stabilize the situation were discussed.

Keywords: *export, import, logistics, measures, pandemic.*

JEL Classification: *F19, F50, G00, R28, R42*

1. Introduction

The modern world cannot be imagined without the daily and hourly movement of goods across borders from suppliers to customers, but sometimes supply chains are under threat due to global factors, which in this case is the COVID-19, the aim of this article is reasearch of the measures against the consequences of the pandemic affection concerned to a global world trade.

1.1. Import-export activity and its role in nowadays world

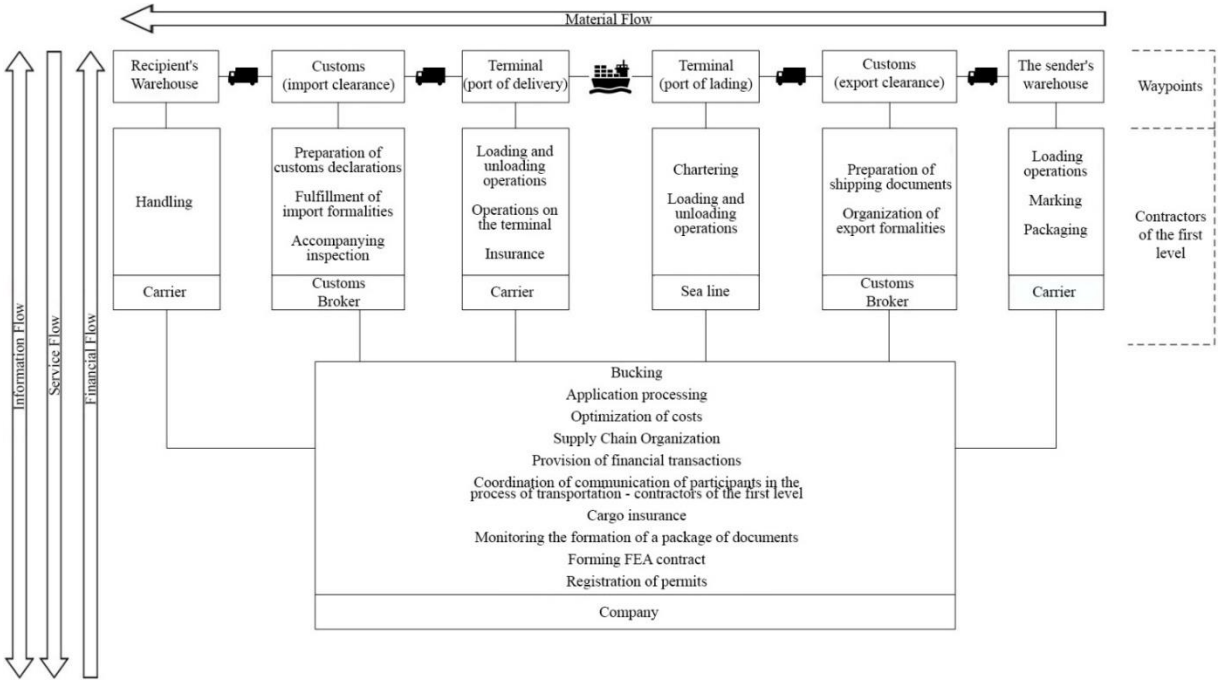
Sustainable economic growth in modern world cannot be imagined without developed foreign economic relations. Import operations are a type of operations in foreign economic activity, when the customs territory of the state is moved goods, finished goods, or turn out services from foreign suppliers. Export operations are a type of operations during foreign economic activity, when goods, finished products are moved outside the customs territory of the country, or services are rendered to a foreign customer. Thus, export-import operations are operations for the movement of goods, raw materials, finished products in the world market because of their sale to foreign buyers. All export-import transactions accompany settlements between counterparties, which creates system of international payments. In 2020, humanity is faced with a new danger factor concerning almost the all of our activity- the SARS-CoV2 viral ineftion, which become a pandemic with name COVID 19, which has affected almost all spheres of society, in particular, the economy and business. The coronavirus pandemic and quarantine have led to an economic crisis unprecedented in the last century. Closed shops reduced demand for goods, and demand for some services fell by almost 100%. As world practice has shown, many business structures and national economies of individual countries were not ready to fully counteract the corresponding crisis phenomena, which actualizes the problems of exports and imports, the economy as a whole in a pandemic.

1.1.1. Present day situation and pandemic affection to support import-export actvity

Today, the countries are in a transitional stage: in the transport and logistics sector, there is an adaptation to the updated operating conditions and a gradual recovery from the crisis. However, there are still a number of risks that can lead to delays and additional costs. Figure 1 outlines the features of maritime logistics, at loading, unloading, at the seaport and customs terminal, contact with people is necessary, and if only these processes were optimized and digitilized, the epidemic would not have so much impact on the logistics processes.

Therefore, the world's leading companies are trying to adapt their activities to quarantine measures, save jobs and minimize losses due to the recession. Because the pandemic has large-scale negative consequences for both the global and national economies, including Ukraine.

Figure 1. Schematic representation of the supply chain of export-import goods by sea transport.



Source: performed by the author

Anticipating the economic impact of the COVID-19 outbreak is challenging due to uncertainty and lack of reliable information. Experts believe that the COVID-19 pandemic is a global crisis that is a catalyst for deep processes and phenomena, but it is still too early to analyze them. According to scientists' calculations, in order to neutralize its negative consequences, the world economy needs an injection of 23-32% of world GDP, which is almost 28 trillion (Palyanychko, 2021). The massive measures have severed well-functioning global supply chains, which could lead to a transition from free foreign trade to a policy of protectionism.

By the onset of the COVID-19 pandemic, the world was witnessing an increase in protectionist trends in international trade, which led to significant changes in traditional production chains and influenced fluctuations in the prices of goods in international markets. The COVID-19 pandemic has resulted in a complete, temporary or partial shutdown of businesses in various industries

Caused a complete, temporary or partial suspension of enterprises in various industries. The global demand for non-critically necessary goods is declining, which leads to the formation of abnormally large stocks, the volume of sales of which is impossible to predict. In addition to barriers in international supply chains, falling prices on world markets and declining demand, the situation in Ukraine is complicated by:

- inadequate quality and lack of product certification;
- slowing down negotiations on entering the markets;
- non-harmonization of Ukrainian legislation with EU norms;
- technical barriers to the export of industrial products to the EU;
- insufficient export quotas for duty-free delivery agricultural products in the EU markets;
- lack of an effective mechanism for representing Ukraine's foreign economic interests abroad;
- level of quality of transport infrastructure;
- the complexity of determining the origin of the goods;
- groundless increase in the customs value of goods;
- long wait for export clearance at customs;
- the complexity of electronic communication with government agencies;
- lack of a system of non-tariff protection against low-quality of imported products. (Pessimistic forecast: losses of the world economy from coronavirus estimated at $ 6-9 trillion, 2021)

1.1.2. Present day situation concerned import-export activity in Ukraine 2021 year and comparing with 2020 year.

In order to present clear and understandable analysis of export-import activities in Ukraine, the author used data from the site State Statistics Service of Ukraine. The data on the official website of statistics State Statistics Service of Ukraine, which represent official statistics and contains information on types of activities in the context of goods, trade volumes and costoms codes, but taking into account the fact that the influence of the coronavirus concerned as separate groups of goods, as a whole trade, this determined the choice of this group, the most profitable and most less pandemic affected. The results of the study are presented in table 1.

The table 1 represents the export occurred by Ukraine in period January – June 2020 and 2021 year.

Table 1. Commodity code and title by Ukrainian Classification of Commodities in Foreign Trade, export 2020-2021

	Export 2020 (thsd. USD)	**Export 2021 (thsd. USD)**	**Absolute deviation**
XV. Base metals and preparations thereof	1616786,1	2671731,7	1054945,6
II. Plant products	1365253,8	1281912,5	-83341,3
XVI. Machines, equipment and mechanisms, electric and technical equipment	1190675,3	1659282,2	468606,9
III.15 Animal or plant fats and oils	956875,2	945257,3	-11617,9
V. Mineral products	932623,5	1989127,2	1056503,7

Source: Foreign economic activity. State Statistics Service of Ukraine.

Table 2 provides a list of goods that imported into Ukraine in the period from January to June 2020 and 2021 and have the largest share in the total volume of imports (State Statistics Service of Ukraine, Foreign economic activity, 2021)

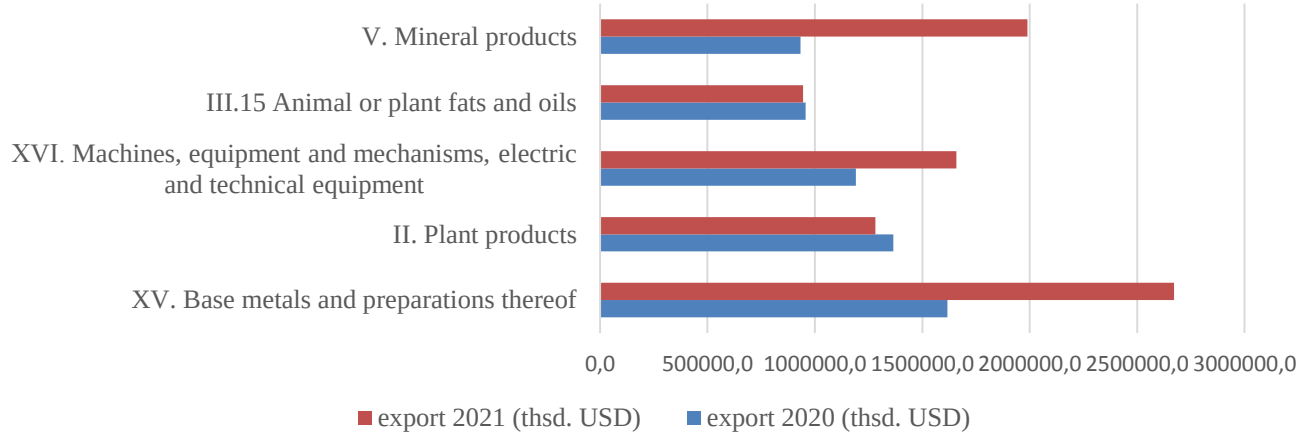
Table 2. Commodity code and title by Ukrainian Classification of Commodities in Foreign Trade, import 2020-2021

Commodity	Import 2020 (thsd. USD)	Import 2021 (thsd. USD)	Absolute deviation
XV. Base metals and preparations thereof	2167262,7	2698929,9	531667,2
II. Plant products	1096489,2	1023714,3	-72774,9
XVI. Machines, equipment and mechanisms, electric and technical equipment	2119522,0	1660720,2	-458801,8
III.15 Animal or plant fats and oils	1023714,3	2429840,1	1406125,8
V. Mineral products	900683,6	1124490,2	223806,6

Source: Foreign economic activity. State Statistics Service of Ukraine.

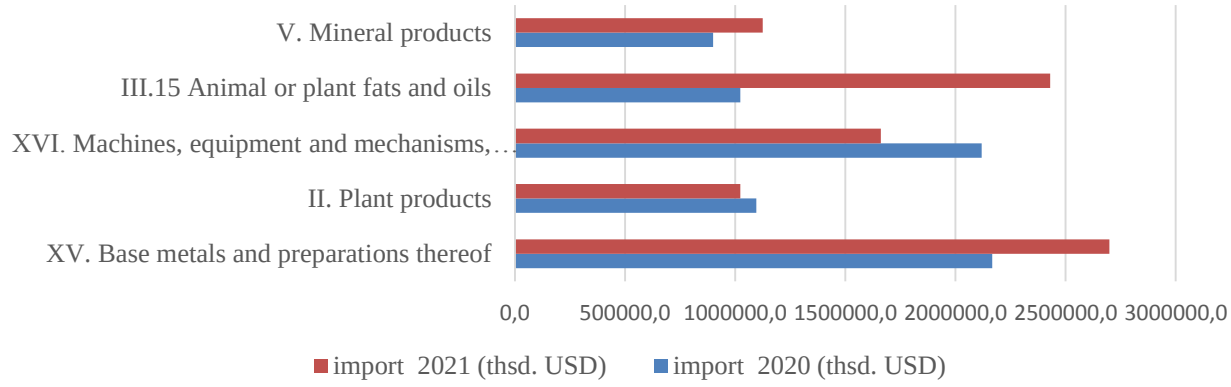
Situation of import and exports operations proceed in Ukraine concerned the trade with EU (the 5 most valuable and profitable goods for import and export are shown in fig. 2 and 3.

Figure 2. Commodity structure of export in 2020-2021



Source: Foreign economic activity. State Statistics Service of Ukraine.

Figure 3. Commodity structure of imports in 2020-2021



Source: Foreign economic activity. State Statistics Service of Ukraine.

To compare the export and import of commodity into Ukraine in the period from January to June 2020 and 2021 data about import and export commodities was combined and summarized in table 3.

Table 3. Analysis of Ukraine's foreign trade in 2021-2020

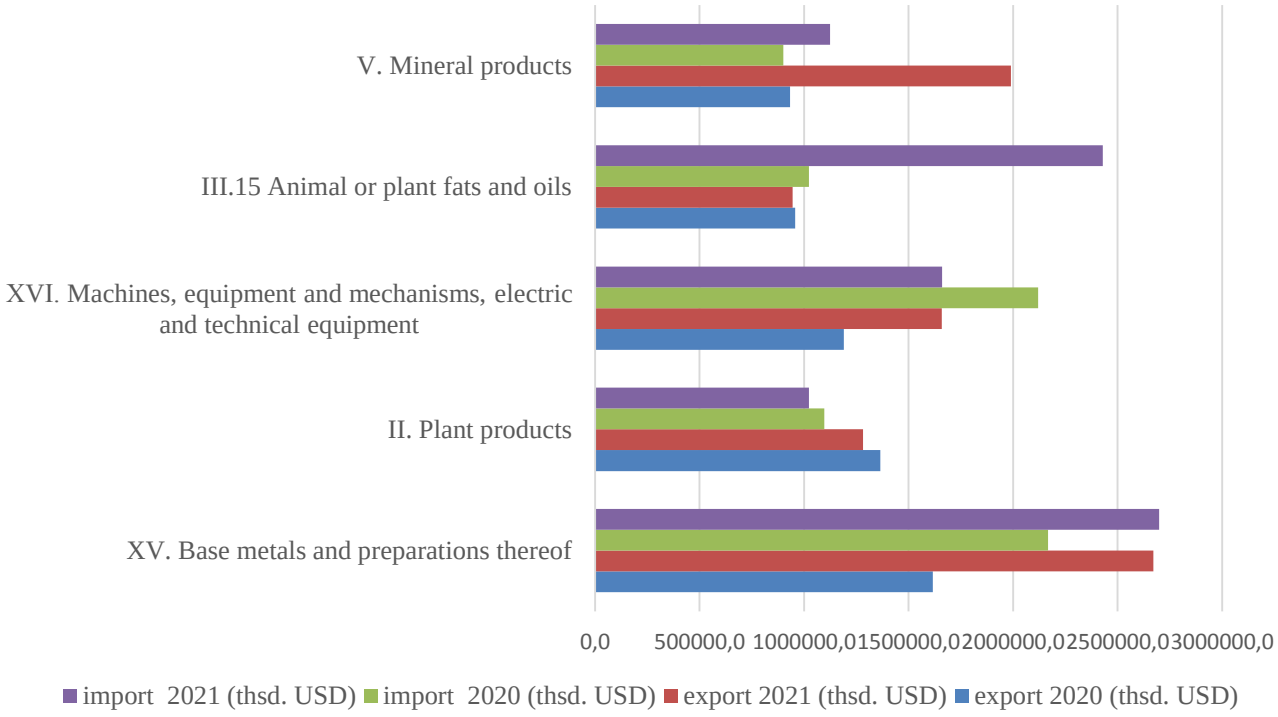
Commodity	export 2020 (thsd. USD)	export 2021 (thsd. USD)	Deviation 2021/2020	import 2020 (thsd. USD)	import 2021 (thsd. USD)	Deviation 2021/2020
XV. Base metals and preparations thereof	1616786,1	2671731,7	1054946	2167262,7	2698929,9	531667,2
II. Plant products	1365253,8	1281912,5	-83341,3	1096489,2	1023714,3	-72774,9
XVI. Machines, equipment and mechanisms, electric and technical equipment	1190675,3	1659282,2	468606,9	2119522,0	1660720,2	-458802
III.15 Animal or plant fats and oils	956875,2	945257,3	-11617,9	1023714,3	2429840,1	1406126
V. Mineral products	932623,5	1989127,2	1056504	900683,6	1124490,2	223806,6

Source: Foreign economic activity. State Statistics Service of Ukraine.

In order to track the main trends in export-import operations in Ukraine under the influence of Covid-19, it is necessary to combine data on export and import operations for the period 2020-2021 in fig.4.

The import arised more than 30 percents higher, and these numbers do not mean that Ukraine have solved structural problems in trade (and the dominance of commodities, equalization of access to markets with key partners and insufficient financial support for exports). Numbers figures are rather evidence that Ukrainian business is competitive, despite crises and challenges like the COVID-19 pandemic, and the sales representative summed up (Levchuk K., 1 July 2021).

Figure 4. Structure of Ukraine's foreign trade in 2021-2020



Source: Foreign economic activity. State Statistics Service of Ukraine.

1.1.3. The measures against the pandemic performed by other countries.

The spread of COVID-19 in China and the high contraction of the domestic demand for non-essential goods slowed the growth of imports of mobile phones, laptops, graphic cards and computers in February-March. The introduction of quarantine measures stimulated the purchase of food and pharmaceutical products. Quarantine measures which grouped in the following areas: restrictions on population movement, health measures, management and socio-economic activities, social distancing, isolation (The #COVID-19 Government Measures, May 2020). In the socio-economic sphere, countries have limited foreign trade in food and health products. The study monitored changes in trade policy in the context of the spread of COVID-19.

According to the Ministry of Foreign Affairs of Ukraine, in countries such as: Austria, Great Britain, Australia, Azerbaijan, Armenia, Vietnam, Algeria, Georgia, Denmark Israel, Italy, Jordan, Latvia, Moldova, Netherlands, UAE, Poland, Romania, Singapore, Tajikistan, Tunisia, Turkey, Finland, Sweden have abandoned export-import restrictions. In Argentina, Greece, Egypt, Spain, Qatar, Canada, Cyprus, Korea, Lithuania, Morocco, Portugal, Slovenia, Turkmenistan, Hungary, Uzbekistan, Croatia, Czech Republic, Montenegro, Switzerland took indirect measures to protect the economy. The group of some countries in which, there have been changes in trade policy includes Iran, Germany, North Macedonia, Serbia, Japan. Foreign trade was stimulated in the Peru (Ministry of Foreign Affairs of Ukraine, Learn more about changes in foreign trade policy in connection with COVID-19, 2021) . None of the countries of the TOP-15 trade partners of Ukraine in export has been changed their trade policy.

Negative Consequences for Business Governments of countries are developing aid packages aimed at supporting it. These are the following three instruments: lending at reduced rates, a grace period for the payment of tax liabilities, and cash grants. In the United States, $ 1.8 billion has been allocated for entrepreneurs. United States pay protection program to cover payroll costs. In Germany, programs of financial assistance to business have been developed (up to 15 thousand euros to preserve jobs) [1]. To support small and medium-sized businesses, the governments of developed countries have allocated funds for the payment of grants and loan guarantees. Many countries are helping small businesses pay wages to workers who forced to stop working during a pandemic.

Developing countries are granting tax deferrals and lowering tax rates for the hardest hit sectors of the economy. For example, in Turkey, the reduction in the VAT rate and the delay in the payment of social contributions apply only to air carriers, retailers and tourism companies. Developed countries these days are trying to adopting monetary policy measures and asset purchase programs. In an environment of zero or negative interest rates, central banks have moved to buying and corporate bonds. In developing countries, key interest rates are declining and repos are expanding. In developed and developing countries, reserve requirements for commercial banks, capital adequacy and liquidity requirements for expanding credit supply have been relaxed (Saha D., Movchan V., Kravchuk V., Kirchner R., & Poluschkin G., April 2021).

In the field of trade and economic cooperation with contries, so Ukraine should implement the following measures:

- to determine the conditions for the application of measures aimed at ensuring the protection of the national interests of Ukraine in the context of increased protectionism of other countries, as well as in emergency situations (taking into account the WTO, World Trade Organisation, norms), to improve the national legislation;
- improve the legal framework in terms of the application of trade protection instruments (anti-dumping, anti-subsidization and special), which will increase the efficiency and transparency of trade investigations using modern data exchange technologies;

- develop mechanisms to protect national producers from manifestations of unfair and growing imports through the use of trade protection instruments and protectionist policy measures of other states through the prevention, liberalization and abolition of trade barriers in relation to Ukrainian goods in foreign markets;
- improve the legal framework for protecting the interests of Ukraine using the WTO mechanisms and international treaties;
- Introduce constant monitoring of the domestic market, export and import of agricultural and food industry products, personal protective goods for the population, medical equipment, medical products, pharmaceuticals. (Cabinet of ministers of Ukraine, 2020a).

When forming a package of assistance to the affected industries, the state should provide for both monetary and fiscal instruments. First, adequately finance the health care system. The discount rate of the National Bank is 8% (Center for Foreign Policy Studies National Institute for Strategic Studies, April 2020), it should be reduced simultaneously with the central banks of the most leading countries of the world. The Central Bank of Great Britain, the Bank of England, went this way, reducing the base rate to 0.1%, the base rate of the Bank of Canada after a two-fold reduction is 0.75%, the Bank of Korea reduced the discount rate to 0.75%, the Bank of Australia - to 0.25%, the Central Bank of Indonesia - to 4. % . The European Central Bank kept the base interest rate at a historical minimum of 0%, and the deposit rate at the level of –0.5% (Center for Foreign Policy Studies National Institute for Strategic Studies, April 2020).

Responding to the pandemic, many countries, on the one hand, reduced or completely abolished import duties on a number of goods, and, on the other, restricted or prohibited the export of "critical" goods.

In such a situation, timely, transparent and effective exchange of information between countries becomes very relevant. For example, exporters and importers need to be aware of new procedures and regulations affecting exports and imports, only imposed export restrictions, tariffs, taxes and regulations, and new customs and transportation regulations. Without this information, essential equipment, such as medical supplies to fight COVID-19, badly needed in the country of import, could be blocked at the border.

WTO Agreements promote international trade transparency through formal, public communication of all laws and regulations that affect trade. Messages submitted by WTO member countries are included in databases covering a wide range of trade policy activities and are available online.

WTO members are currently working to address the challenges posed by the spread of the COVID-19 pandemic by strengthening coordination and cooperation at the international level. This trend was reflected in the Joint Ministerial Statement of WTO Members on COVID-19 and the Multilateral Trading System, which was made with the participation of 42 countries, including Ukraine, on May 5, 2020. In the Statement, WTO members noted the need to intensify efforts to strengthen coordination and cooperation on internationally by ensuring: compliance with the WTO rules of trade restrictions imposed by members in response to the global crisis. Such restrictions must be purposeful, proportionate, transparent and temporary; full-fledged functioning of global supply chains and free circulation of necessary products (including medical and food products); preventing the introduction of unjustified measures to restrict the export of agricultural products, which may have a negative impact on food security and public health.

As evidenced by the latest WTO CEO's latest mid-year Trade-related Events Report, presented to Members on July 24, 2020, between mid-October 2019 and mid-May 2020, WTO Members introduced 363 new trade events. 198 of these facilitated trade and 165 restricted it.

Most of them, namely 256 (about 71%) are temporary and related to the pandemic, of which 147 facilitated trade and 109 limited it (Cabinet of Ministers of Ukraine, 2020c). Obviously, the assistance was ad hoc and related to “critical” goods for each country.

As it can be seen from the reports of the WTO member countries, initially most of the activities were aimed specifically at medical products. This list included protective medical masks and gloves, special suits, disinfectants, medicines, ventilators and other medical equipment that help in the fight against the new coronavirus. Such measures were introduced for a period of up to three months on average with a subsequent extension. For example, Australia applied temporary tariff concession measures to facilitate the import of these goods as early as February 1 through July 31, and subsequently extended these measures until the end of the year.

In early May 2020, several countries ended export restrictions on products such as surgical masks, gloves, medicines and disinfectants. Other measures taken in the early stages of the pandemic are being phased out. According to the Report, about 28% of the COVID-19 trade restriction measures adopted by WTO members were lifted by mid-May.

Nevertheless, the current situation in the world forces countries not only to weaken tariffs on medical / protective goods, but also to take into account the domestic provision of the population with "critical" products in the context of global isolation. Despite some voluntary statements and memoranda of WTO members to ensure and protect sustainable supply chains, reduce or eliminate tariffs on essential goods and agricultural products, many countries have introduced restrictive trade measures mainly on staple foods such as sugar, cereals, buckwheat, meslin, rice, vegetables, soybeans, sunflower seeds, prepared foods and oils to secure local food supplies and ensure food security.

For example, the Eurasian Economic Union introduced a ban on the export of onions, garlic, turnips, rye, rice, buckwheat, cereals, sunflower seeds, etc. From April 3 to July 3, 2020, Belarus introduced a temporary restriction on the export of some basic food products (buckwheat, onion, garlic). Egypt banned the export of some legumes (beans and urea are still banned from export). China temporarily reduced import tariffs not only on medical products, but also on some categories of raw materials, agricultural products, and meat. The Republic of El Salvador and Honduras have banned the export of certain dried legumes. Indonesia has temporarily canceled the requirement for import certification of onions and garlic. Kyrgyzstan has introduced a temporary ban on the export of certain food products (for example, wheat and meslin, wheat flour, edible oil, rice, pasta, chicken eggs, sugar, iodized table salt, feed (hay, straw, compound feed, bran and grain feed). North Macedonia has imposed a temporary ban on the export of wheat and meslin. The Federation of Saint Kitts and Nevis has abolished import tariffs on certain foods, such as vegetables, fruits, fruit juices, vitamins, and Thailand has banned the export of chicken eggs.

On April 22, 2020, 23 WTO members, including Ukraine, signed a Joint Statement to Securing Open and Intended Trade in Agricultural and Food Products in Response to the COVID-19 Pandemic (Trade and trade-related measures and economic programs, 2021).

Indeed, improving living standards directly depends on the degree to which the population's needs for food are met, therefore, ensuring open and prospective trade in agricultural and food products is equivalent to ensuring food security, which is a priority for any country. In a joint statement, the countries reaffirmed their commitment to ensuring that international markets function and support the movement of agricultural products, which are essential in preventing food shortages and ensuring global food security amid the pandemic.

Countries stressed that they will exercise restraint in building up traditionally exported domestic stocks of agricultural products to avoid disruptions in the supply of related products or distortion of international trade. In addition, countries will not set export restrictions on agricultural products and refrain from using unjustified trade barriers related to agriculture and agricultural products.

Countries reaffirmed that agricultural/agricultural emergency measures to combat COVID-19 must be targeted, proportionate, transparent and temporary, and not create unnecessary barriers to trade or disrupt global agricultural supply chains and agricultural products Any such measures must comply with WTO regulations.

1.1.4. The measures reacted to the pandemic performed by ukranian government

The focus of countries on recovering from COVID requires a new impetus for law enforcement. It is important to maintain open world trade flows. According to the latest calculations of the World Trade Organization, the drop in international trade through COVID-19 this year could be up to 18.5%, which will hurt export-oriented economies. However, for Ukraine, such a situation may, on the contrary, be beneficial. hromadske found out how the pandemic affected Ukrainian exports and imports, what and with whom Ukraine traded, and why the coronavirus could benefit the economy.

According to the official data of the State Statistics Service of Ukraine, in the first half of 2020, Ukraine slightly reduced the volume of exports of its goods abroad. In general, in the first 6 months of this year, which saw the peak of the economic crisis and the most severe quarantine, Ukrainian exports decreased by 6.4% (against the first half of the previous year) or by $ 1.5 billion.

Import of goods to Ukraine suffered much significantly - it fell by 14.3% or more than $ 4 billion. In general, Ukraine exported goods worth $ 23 billion, and imported goods from abroad - $ 24 billion (State Statistics Servise of Ukraine, 2021). The reduction in imports is bad news for the government, because the largest filler of the state treasury is the value added tax paid on goods imported into the territory of Ukraine (import VAT brings every third hryvnia of budget revenues). Consequently, the smaller the volume of imports, the less money the government collects for the budget.

However, more exports than imports are more profitable for the hryvnia, because it means that the economy loses less foreign exchange in trade. In addition, given that, in addition to trade in goods, the economy also enters the economy through investments, government borrowings and remittances of labor migrants, this situation contributes to the strengthening of the hryvnia (Kramar O, 19 February 2021).

According to the State Statistics Service, in April and May 2020, Ukrainian trade was generally "positive", that is, exports exceeded imports by almost half a billion dollars. In general, from a financial point of view, the coronavirus crisis did not harm Ukraine too much (Pilipenko A., & Isakhanova N., 31 August 2021).

The Ukrainian structure of the economy turned out to be quite resistant to the manifestation of the coronavirus. Moreover, the significant share of agricultural products in production and exports is only one of the factors of this. Others include the precipitous fall in energy prices, which has lowered the cost of importing them; persistence of demand for IT services of domestic companies; relatively high prices for iron ore and metal products; high demand for the services of domestic migrant workers and others.

However, there is a risk that the situation will worsen in the coming months, because the so-called deferred imports are being implemented: people will start buying more imported goods, which they refused during the tough quarantine phase, such as cars. The effect of deferred imports has already partially manifested itself in the June statistics (the latest for today) - then imports exceeded exports by $ 647.5 million - most of all since the beginning of 2020 (Impact of COVID-19 and quarantine restrictions on the economy of Ukraine, 2021).

Amid the Covid-19 outbreak in early 2020, governments around the world have been aggressively implementing trade-related measures, affecting global international shipments.

In 2020, Ukraine also introduced bans on the export of certain products - personal protective

equipment and buckwheat. Starting from March 11, 2020, the Cabinet of Ministers of Ukraine adopted a number of resolutions, which temporarily limited the export of certain anti-epidemic goods for a certain time, namely: waterproof laboratory suits, gloves made of other polymeric materials, medical gloves, non-sterile nontrile nitrile nitrile, gloves, insulating gowns disposable medical, medical (surgical) masks, goggles, protective shields, respirators of protection class not lower than FFP2. These restrictions were caused solely by security measures in order to prevent the spread of COVID-19 on the territory of Ukraine (Cabinet of Ministers of Ukraine, 2020b)

On March 23, 2020, the government adopted a resolution "On Amendments to Appendix 1 to the Resolution of the Cabinet of Ministers of Ukraine No. 1109 dated December 24, 2019", which introduced a temporary (until 06/01/2020) licensing regime for the export of undenatured ethyl alcohol with a concentration of 80 % or more of ethyl alcohol and other alcoholic distillates, except for bioethanol, beverages obtained by distillation, denatured of any concentration and other similar goods (according to the code according to UKTVED 2207) with the establishment of a zero quota volume, which is an actual prohibition on the export of such goods.

This decision was supposed to provide healthcare institutions and Ukrainian manufacturers of pharmaceutical products with the necessary raw materials in the context of taking measures to prevent the spread of acute respiratory disease COVID 19 in Ukraine. On April 2, at an extraordinary meeting of the government, the resolution "On Amendments to Appendix 1 to the Resolution of the Cabinet of Ministers of Ukraine No. 1109 dated December 24, 2019" was adopted, which prohibited exporting buckwheat to foreign markets until July 1. This decree introduced a temporary, until 07/01/2020, regime of licensing and quotas for the export of buckwheat and hulled buckwheat grain (without fruit shell). In particular, a zero quota was set for these goods. The ban on the export of buckwheat was a temporary measure necessary to protect the domestic market (Belarus, Russia and Kazakhstan also temporarily closed their borders for the export of buckwheat).

2. Data and methods

Empirical studies were performed for data analysis and determining the effectiveness of measures occurred by Ukrainian government, estimation the import-export conditions in 2020-2021 year.

Data analysis and synthesis were used to analyze and combine together different data, like measures against pandemic used by other countries, and then finally make a conclusion due to information above.

expert assessments were used as a way of evaluation supportive economy measures and restrictive measures occurred.

Generalization method was used to determine the common features and characters of different solutions implemented by countries. All these methods were used to perform the scientific inquiry.

3. Results and discussion

Undoubtedly, today most experts and countries haven’t found most reliable and fast decision, but economy can’t wait until others, easier ways will arised, so I recommend to follow the developed countries and implement same set of measures. Currently, the economic damage from the COVID-19 pandemic has to be assessed yest due to the further spread of the virus. Studies of the measures taken by the countries of the world to stimulate the economy in the context of the coronavirus have shown that most developed countries are trying to restore their

economies through the mobilization of financial resources, the introduction of large-scale programs to support producers and tax breaks. However, some developing countries are introducing temporary foreign trade restrictions to avoid a shortage of products in the domestic market, and are using other economic incentives to mitigate the consequences of the pandemic.

Economic measures to counter the pandemic and temporary trade restrictions introduced in Ukraine. COVID-19 has almost no effect on the export of goods, however, together with other global trends. It has led to a decrease in critical imports. The presence of systemic and crisis gaps in Ukraine's trade policy requires the use of urgent measures in the field of trade and economic cooperation with the countries of the world.

4. Conclusions

Despite the fact that the pandemic has been going on for more than two years, and most countries have already developed some kind of strategy to reduce affection of it, the panemic continues to damage the global economy and trade. Of course, all measures are to one degree or another effective, but which ones will better cope with the problem facing the world can be evaluated only after the end of the active phase of the pandemic and the full recovery of the economy.

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The Impact of Income Inequality on Economic Growth in Algeria: The ARDL Approach

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Abstract

The income inequality can be brake on growth and can lead to instability. It also effects on health spending and reduces the educational performance of poor. This paper investigates the impact of income inequality on economic growth in Algeria over the period 1980-2015, by using the Autoregressive Distributive Lags (ARDL) approach and the Error Correction Model (ECM). The findings of Bound-test suggest that there is a long-run equilibrium between income inequality and economic growth. There is a positive and significant impact of income inequality on growth in Algeria, an increase in inequality by 1% will enhance economic growth by 7 % in the long run. However, reducing income and wealth inequality is a necessity to prevent further increases and maintain the sustainable growth in Algeria.

Keywords: *Income Inequality, Gini index, Economic Growth, ARDL, Algeria*

JEL Classification: *D63, D31, O47, C13, O55*

1. Introduction

During the last decades, Algeria reported a significant achievement in human development indicators. According to the most recent human development report (UNDP,2015), Algeria is one of the African countries that achieved the greatest human development index deficit reduction between 1990 and 2015. Despite the improvement of GDP per capita and the social condition of the individuals, economic and regional inequalities persist and continue to be a key issue.

Since independence, Algeria has experienced a high inequality level due to the large disparity in the distribution of assets and capital amongst the individuals. In the early 1990s the inequality increases due to the repercussions of economic reforms adopted by the government, which provided substantial opportunities for some groups to raise their wealth through privatization decisions and ownership agricultural lands, unlike other groups, witnessed a decline in the general level of wages, which negatively affected savings and investment rates.

In this regard, the Algerian authorities adopt a series of reforms of social protection, which help direct the poor and the needy by providing free basic goods and services and subsidy the food. (Laabas Belkacem) These efforts lead to a decline in the overall income inequality over time.

Today, Algeria experiences a marked distinction between the littoral areas and the Sahara. The metropolitan areas of the north include the dynamic country's economic activities and are less affected by poverty, unlike the areas in the south, which contain the majority of the population living below the poverty line. Therefore, the polarization of the resources in favor of metropolises aggravate the regional economic inequalities and cause unemployment in disadvantaged regions, Saharan in particular. And lead to higher inequality in the distribution of income and the average monthly spending of households between the coastal area and the Sahara. (Laabas Belkacem)

This study aims to investigate the long run relationship between income inequality and economic growth in Algeria. This paper contributes to the recent literature by studying the nexus inequality-growth in Algeria using the Auto Regressive Distributed Lags (ARDL) model.

This paper is organized as follow. Section 2 provides a brief literature on the link between inequality and economic growth. Section 3 presents the empirical studies. Section 4 deals with the data and the methodology. Section 5 reports the results of the ARDL approach, and we conclude in Section 6.

2. Literature review on inequality and growth

The traditional theory of growth established a direct relationship between economic growth and standard of living. The first thesis, developed by Kuznets (1955), showed that the relationship between GDP per capita and inequality is in the form of a U-inverted. Kuznets argued that higher inequality promotes growth at the early stage of economic development, and diminishes economic growth at the later stage of economic development.(Laabas Belkacem)

Following the pioneering work of Kuznets (1955), the link between income inequality and growth has dominated the development literature to determine whether inequality is good or bad for growth. Some of these studies indicate that income inequality inhibits economic growth, while others argue that high inequality is associated positively with growth.

From a theoretical perspective, high levels of income inequality are enhancing growth for a number of reasons.

- Classical and neoclassical theories (Keynes, 1920; Kaldor, 1957) predicted that high inequality stimulates economic growth through the ***saving*** and ***investment*** channel. Since the rich have higher propensity to save then the poor, a rise in income inequality level increases the aggregate savings and the capital accumulation which translate into higher investment. (Laabas Belkacem)
- Kuznets (1955) argued that a high level of inequality in the distribution of resources is necessary to realize large investments at the first stages of development, which in turn lead to raise factor productivity and promote economic growth.
- In addition, high wage inequality encourages the workers to work hard and to seek for employment in innovative sectors, which requires higher skills labor and provides higher wages, which lead to increase the productivity of the economy on overall and enhance the growth. (Laabas Belkacem)
- John Maynard Keynes (1936) argued that inequality is harmful to growth. Since the marginal consumption rates are fairly equal among all income groups, the aggregate consumption depends on changes in aggregate income. Therefore, an increase in income inequality reduces aggregate consumption and slows economic growth.[1]
- Higher inequality retards growth by reducing effective aggregate demand in the economy. In highly unequal societies, the poor have limited disposable income for the purchase of manufactured goods. This limit reduces the size of the domestic market and declines the potential for industrialization, which is the engine driver of growth.[1]
- Greater inequality affects growth negatively through the ***capital market imperfections*** channel. Due to the capital market distortions, the exploitation of investment opportunities is limited only to individuals with a high enough level of income of wealth. As a result, poor families tend to abandon investment in human capital, which offers relatively high rates of return that benefits them and society. Therefore, an increase in inequality slows human capital accumulation and growth.[1]

- Contemporary studies argued that inequality is bad for growth. Higher income inequality creates pressure to adopt redistributive policies through the ***Fiscal channel***. These efforts may undermine capital accumulation and investment, and lead to decrease growth.
- In addition, greater inequality hinders growth through the ***Socio-political instability*** channel. Inequality supports social unrest by increasing the likelihood of coups, revolutions, and collective violence. These activities threaten property rights and motivate the poor to engage in crime. These actions cause social dysfunction and reduce the productivity of the economy.
- Higher inequality can adversely affect economic growth through the ***Fertility*** channel. Poor families tend to have more children and invest less in education. Therefore, large fertility differentials decrease human capital accumulation and growth (De la Croix, Doepke; 2001).

3. Empirical studies

In recent decades, the issue of income inequality attracts much attention in the world. Several studies have covered various aspects of inequality in both developed and developing countries. The findings of these studies were not conclusive and offered contradictory results.

Alesina and Rodrik (1994) claim that inequality in assets and income ownership is associated negatively with subsequent economic growth. High inequality calls for redistributed policies and taxation, which reduce the aggregate investment and growth.[1]

Barro (2000) investigated the relationship between income inequality and rates of growth and investment for a panel of countries. He argues that high inequality promotes growth in rich countries and slows growth in poor places.[1]

Banerjee and Duflo (2003) found a nonlinear relationship between inequality and growth rates, by using data across countries and using a non-parametric method the authors suggested that the relationship between the growth rates and net inequality takes a shape of inverted U and that Changes in the inequality in any direction are associated with lower growth in the coming period.[1]

Voitchovsky (2005) examined the importance of the shape of income distribution as a determinant of economic growth based on comparative data on disposable income for 25 countries in 1970-1995. The author argues that inequality at the top end of the distribution is positively correlated with growth, while the inequality at lower down of the distribution is associated negatively with subsequent growth.

Knowles (2005) used consistent data on inequality of expenditure to explore the nexus between inequality and growth in a sample of developing countries. He finds a significant negative correlation between consistently measured data and economic growth. And he argues that all of the recent empirical work on the relationship between income inequality and economic growth has used inequality data that are not consistently measured.[1]

4. Data and Methodology

4.1. Data

Based on the previous work on the link between inequality and economic growth such as Barro (2000), Forbes (2002), Voitchovsky (2005), Cingano (2014), and Ostry et al. (2014), Naguib (2015), we specify the following model.

$$LnY = \beta 0 + \beta 1\, Gini + \beta 2\, Life + \beta 3\, Edu_F + \beta 4\, Edu_M + \beta 5\, Inv + \beta 6\, Opens + \varepsilon i$$

Where:

LnY: The natural log of GDP per capita
Gini: Gini index
Life: Life expectancy at birth
Edu_F: Primary enrollment ratio, Female
Edu_M: Primary enrollment ratio, Male
Inv: Total investment (% GDP)
Opens: Economic openness (% GDP)
εi: the white noise error term

All the variables are annual data covered the period 1980-2015 collected from The World Development Indicators Database (WDI.2018), The World Economic Outlook Database (WEOA.2018), The Lahoti et al. (2016) dataset of income inequality. The summary statistics of the variables are expressed in table.

Table 1. Summary statistics of the data series

	LY	Gini	Life	Edu_M	Edu_F	Inv	Opens
Mean	8.251307	50.32588	69.08831	108.1779	95.07886	32.02150	71.31693
Median	8.227340	49.74872	69.13601	106.4855	94.64779	30.25350	69.00948
Maximum	8.467918	51.52361	75.85529	123.4057	115.9805	52.76800	89.64018
Minimum	8.059876	49.74871	58.16402	97.96403	78.75323	22.44000	53.11851
Std. Dev.	0.120614	0.780342	4.841779	7.498917	12.46048	7.383299	11.18881
Observations	36	36	36	36	36	36	36

Source: Own Calculation

4.2. Methodology

This paper applied the autoregressive distributed lags (ARDL) approach introduced by Pesaran et al. (1996) to examine the long relationship between income inequality and economic growth.

The first advantage of this approach is that it allows us to explore both the short and long-run relationship between growth and its determinants. Second, it can be applied irrespective of whether underlying variables are stationary at the level I*(0),* or at the first difference *I(1)* or mutually co-integrated (Pesaran and Shin, 1999). Third, the ARDL takes a sufficient number of lags to capture the data generating process in general-to-specific modeling framework. And, finally, it is robust in finite samples.[1]

The ARDL approach is consists of four steps. First, we applied the unit root test of augmented dicky-fuller to ensure that all the variables are not integrated into order two. Second, we select the optimal lag length based on the Akaike criterion. Third, we examine the long relationship between the variables by using Bound-test of cointegration, and then the error correction model (ECM) for the short run relationship. Fourth, we apply different diagnostic tests to ensure the stability and the efficiently of the estimated model.

In this paper we use the following model:

$$\Delta LnYt = \alpha 0 + \sum_{i=1}^{n} \alpha 1i\Delta LnYt - 1 + \sum_{i=1}^{n} \alpha 2i\Delta Ginit - 1 + \sum_{i=1}^{n} \alpha 3i\Delta Life\ t - 1$$
$$+ \sum_{i=1}^{n} \alpha 1i\Delta Edu\_Mt - 1 + \sum_{i=1}^{n} \alpha 2i\Delta Edu\_Ft - 1 + \sum_{i=1}^{n} \alpha 4i\Delta Inv\ t - 1$$
$$+ \sum_{i=1}^{n} \alpha 5i\Delta Opens\ t - 1 + \beta 1\ LnY + \beta 2\ Gini + \beta 3\ Life + \beta 4\ Edu\_M$$
$$+ \beta 5\ Edu\_F + \beta 6\ Inv + \beta 7\ Opens + \varepsilon i \ldots (1)$$

Where:
Δ: Denotes the first difference operator
α: is the drift component
εi: is the white noise residuals

5. Empirical results

5.1. Unit test root

The estimation starts with applying a unit root test of Augmented Dickey-Fuller (ADF) to check the stationery of the variables. The results mentioned in Table (2) show that Gini and life are stationary at the level, while the other variables are stationary at the 1st difference. Then, we ensure that no series under consideration is integrated of order 2.

Table 2. Unit root test results

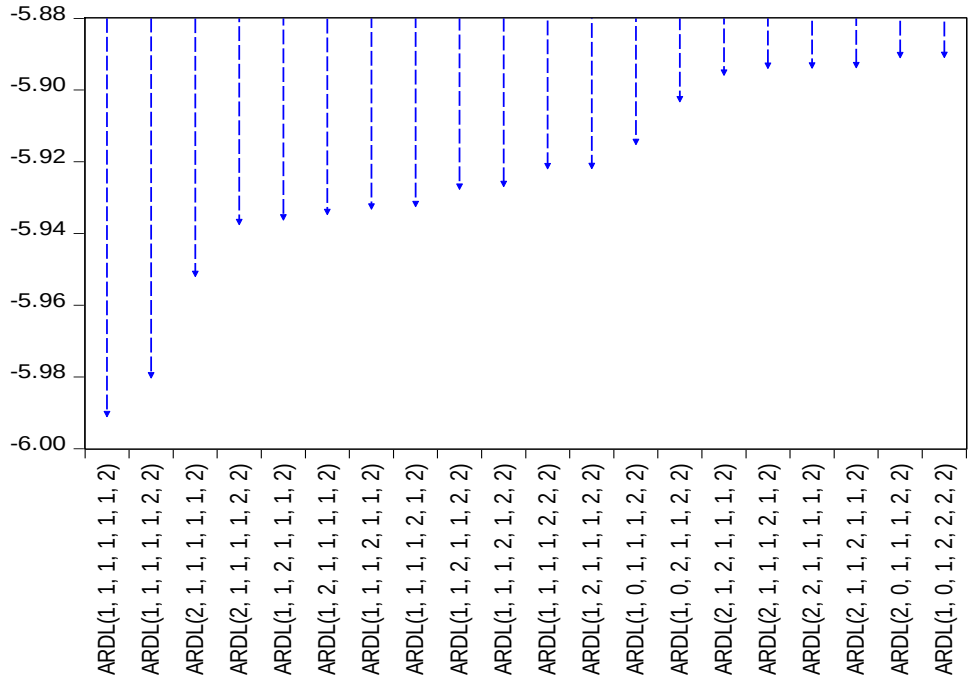
Variable	At level		At 1st difference	
	constant	trend and constant	constant	trend and constant
LY	-0.31	-0.71	-3.13***	-3.34***
Gini	-15.69***	0.46	-2.41	-5.06***
Life	-3.69***	0.46	-2.41	-5.06***
Edu_M	0.47	-3.12	-2.98**	-2.90***
Edu_F	0.25	-3.28	-3.36**	-2.49**
Inv	-0.15	-1.74	-6.77***	-5.26***
Opens	-0.64	-2.47	-4.12***	-4.54***

Notes: (*) significant at the 10%; (**) significant at the 5%; (***) significant at the 1% and (no) not significant
Source: Own Calculation

5.2. Lags selection

The ARDL procedure starts by determining the appropriate lag order based on Akaike Information Criterion (AIC) in order to select the optimal lag length. The figure 1 shows that the model ARDL (1,1,1,1,1,1,2) is the optimal model because it has the lowest AIC criterion.

Figure 1. The optimal model using Akaike criterion



Source: Own Calculation

5.3. Cointegration test

The results of the Bound-test approach of long-run cointegration mentioned in the table (3) indicate that the calculated F-statistic for the model (10.81) exceeds the lower and the upper Bound critical value at 1%, 2.5%. 5% and 10%. Therefore , we reject the null hypothesis of no cointegration. Thus, there is long-run cointegration among the variables.

Table 3. The Bounds test outcomes

F-Bounds Test			**Null Hypothesis: No levels relationship**	
Test Statistic	Value	Signif	I(0)	I(1)
F-statistic	10.81	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Author's estimation in Eviews 10

Table 4. The estimated short-run coefficients ARDL model

Dependent variable: D(LY)

Included observations: 34 after adjustments

Selected model: ARDL (1,1,1,1,1,1,2)

Variable	**Coefficient**	**Std.Error**	**t-Statistic**	**Prob ***
D(Gini)	-0.08	0.02	-4.02	0.00
D(Life)	0.29	0.02	12.43	0.00
D(Edu_M)	-0.01	0.00	-2.68	0.01
D(Edu_F)	0.01	0.00	2.65	0.01

D(Inv)	0.00	0.00	1.24	0.22
D(Opens)	0.00	0.00	3.20	0.00
D (Opens (-1))	0.00	0.00	4.87	0.00
CointEq (-1)*	-0.71	0.06	-10.87	0.00

Source: Author's estimation in Eviews 10

The results of the ECM model reported in the table (4) reveal that income inequality is associated negatively and significantly with economic growth. In the short-run an increase in inequality by 1 % reduces the growth by 8 %.

The error correction term CET-1, which measures the speed of adjustment to restore the equilibrium in the dynamic model is negative and highly significant. This finding confirms the existence of a long-run equilibrium between economic growth and income inequality. The coefficient of *CE(-1)* is equal to 0.71 this implies that the deviation from the short run in economic growth is corrected by 71 % percent over each year in a long span of time.

Table 5. The estimated long-run coefficients ARDL model

Dependent variable: LY

Included observations: 34 after adjustments

Selected model: ARDL (1,1,1,1,1,1,2)

Variable	**Coefficient**	**Std.Error**	**t-Statistic**	**Prob ***
Gini	0.07	0.02	3.02	0.00
Life	0.06	0.01	5.54	0.00
Edu_M	0.01	0.00	1.13	0.27
Edu_F	-0.01	0.00	-1.37	0.18
Inv	0.005	0.00	2.52	0.02
Opens	0.001	0.00	0.36	0.72
C	-0.06	0.77	-0.08	0.93

R-Squared= 0.89

Adjusted R-Squared=0.87

Durbin –Watson stat= 2.31

Source: Author's estimation in Eviews 10

The long-run results mentioned in the table (5) indicate that there is a positive and significant impact of income inequality on economic growth, implies that in the long run, a 1% increase in income inequality will stimulate economic growth in Algeria by nearly 7 %.

5.4. Diagnostic test

In the last step, we run various diagnostic tests to establish the stability of the estimated model we perform the Jarque-Bera test for normality, the ARCH test for heteroscedasticity and the Breusch-Godfrey test for serial correlation. Table (6) reveals that the estimates are free from serial correlation, heteroscedasticity, and normally distributed (All P. values are higher than critical values of 0.05).

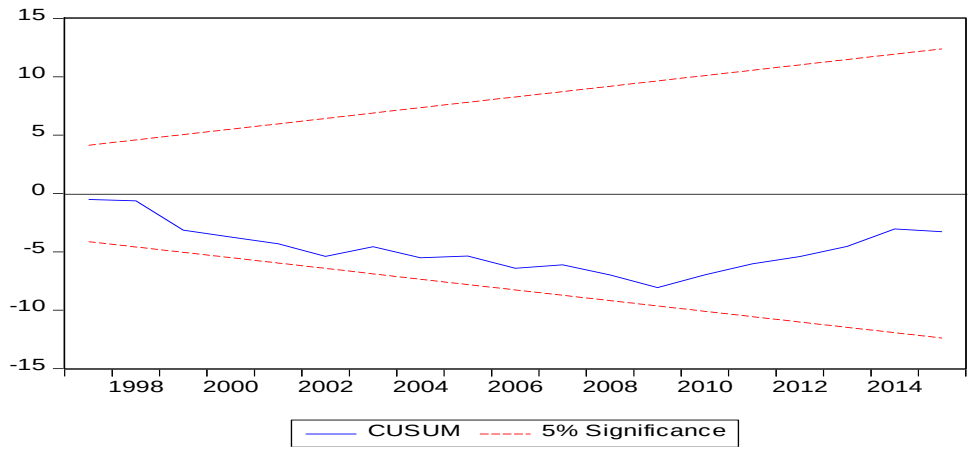
Table 6. The diagnostic test outcomes

Test	Results
Heteroscedasticity	0.82
	(0.63)
Normality	0.68
	(0.70)
Serial correlation	0.65
	(0.53)

Source: Author's estimation in Eviews 10

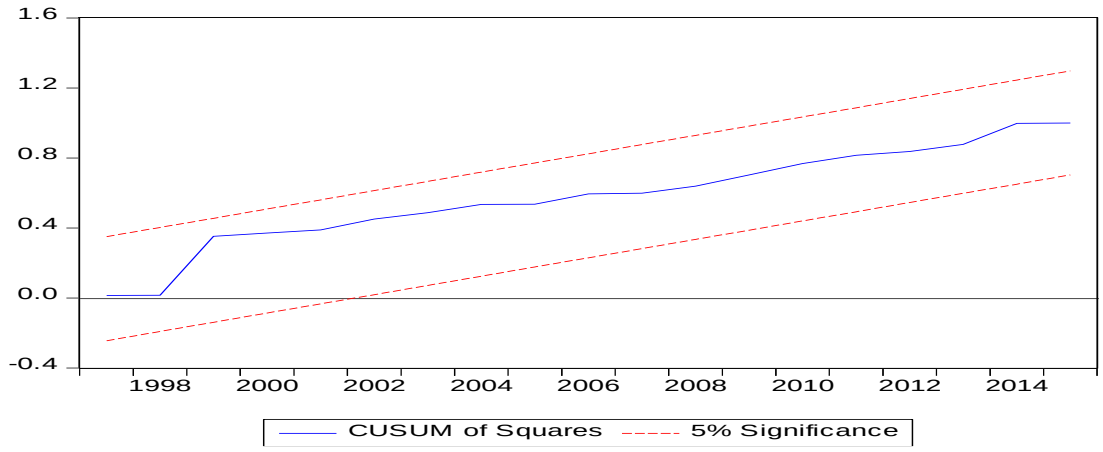
The figures 2 and 3 show the cumulative sum of recursive residuals (CUSUM) and the cumulative of the sum of squares of recursive residuals (CUSUMQ) plots respectively. It can be seen that the estimated model is structurally stable. The plots fall within the lines of the critical values of 5 %. It is further improved the reliability of the model.

Figure 2. The cumulative sum of recursive residuals (CUSUM)



Source: Own Calculation

Figure 3. The cumulative sum of squares of recursive residuals (CUSUMQ)



Source: Own Calculation

6. Conclusion

This paper investigates empirically the impact of income inequality on economic growth in Algeria over the period 1980-2015, by using Auto Regressive Distributed Lags (ARDL) approach to explore the long-run cointegration, and the error correction model to examine the relationship in the short run. The findings of Bound-test of cointegration reveal that there is a long-run equilibrium between income inequality and economic growth in Algeria. The estimation, in the long run, indicates that income inequality has a positive and significant effect on economic growth in the period under study.

These findings are consistent with the theoretical assumptions, which argue that inequality enhances growth. The concentration of wealth and income in the hands of a few individuals in Algeria leads to increase accumulation of physical and human capital, which stimulates investment and benefits the economy as a whole.

However, there is a need to tackle the existing inequality to prevent further increases and stimulate the performance of the Algerian economy. This fight against this issue becomes a necessity for governments to ensure greater equity and support sustainable growth.

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Electrical Conductivity and Germinability of Millet Seeds from Different Accessions

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Abstract

Physiological quality of millet seeds is one of the main problems of the present time affecting millet production since it affects proper establishment of seedlings in the field. Farmers from different regions in Uganda save and store seeds for planting in the next season after harvesting using different methods hence a likelihood of variation in seed quality. Therefore, this study was conducted to assess the germinability and electrical conductivity of seeds picked from northern and eastern Uganda. Laboratory tests were done at the Department of Agriculture, Kyambogo University in 2020 in Uganda. Experiment was laid as a Completely Randomised Design (CRD) with three replications. Millet seeds collected from Lira, Nebbi and Soroti districts respectively constituted the treatments of the study. Data was collected on germination percentage, germination speed, radical length and electrical conductivity. Electrical conductivity of the millet seeds was recorded in 24hour interval (24, 48 and 72hours). The electrolyte leakage was measured using a conductivity meter. Data was subjected to analysis of variance of Genstat and the means separated using least significant difference (LSD) tests at 5% level of significance. There was no significant ($p>0.05$) difference in germination and electrical conductivity of the millet seeds from the three accessions. Lower electrical conductivity of 8.3, 7.6 and 8.0 $\mu Scm^{-1}g^{-1}$ and higher germination of 86.7, 81.7 and 91.7% in Nebbi, Lira and Soroti districts respectively were recorded. Both electrical conductivity and germination tests proved that the quality of millet seeds from the three accessions was good. However, additional studies with wider scope in terms of millet varieties and accessions is needed to validate the result of this study.

Keywords: *Electrical conductivity, Germinability, Millet, Quality, Uganda.*

1. Introduction

Millets are among the staple human food for the poorest and most food-insecure people in several parts of world (Mitaru, Mgonja, Rwomushana & Opio, 2012; Ali, Idris & Abo, 2014; Hassan, Sebola & Mabelebele, 2021; Rouamba, Shimelis, Drabo, Laing, Gangashetty, Mathew, Mrema & Shayanowako, 2021). In Eastern and Central Africa (ECA), millet is a major food security crop predominantly in semi-arid environments because of its tolerance to drought which often causes widespread crop failure of non-traditional food crops (Mitaru et al., 2012). In Uganda, over 80% of the population involved in subsistence agriculture grow and consume millet (Owere, Tongoona, Derera & Wanyera, 2014). Millet is mainly grown in northern (Acholi), northeastern (Karamoja) and eastern (Teso) regions (Tenywa, Nyende, Kidoido,

Kasenge, Oryokot & Mbowa, 1999; Lubadde, Tongoona, Derera & Sibiya, 2016). These regions are characterised by semi-arid climate with high temperatures, low mean annual rainfall and widespread chronic food insecurity (Lubadde et al., 2016). Generally, pearl millet (*Pennisetum glaucum*) and finger millet (*Eleusine coracana*) are known as the two major millets used for food and feed. Millet genotypes and landraces are cultivated, harvested, processed and seeds saved and kept in tins and sacks by famers for next planting. Ministry of Agriculture, Animal Industry and Fisheries [MAAIF], (2018) reported that about 85% of seed planted in Uganda is obtained from informal sources, mainly farm-saved seed, local markets, and social networks. Yet, there are over 35 registered seed companies producing an estimated 18,000 MT of seed (MAAIF, 2018). Hence, this makes the seed that farmers use for their farming to be of questionable quality.

Establishing the quality of a seed lot is a critical step in crop production. This is because low quality as showed by seed vigor is one of the many problems that limit grain millet production because it affects field establishment (Mwageni &Vanderlip, 1986; Rinaldi, Javorski, Javorski, Simonetti, Chiapetti, Rocha, Abade, Hendges, Lubian, Barbosa, Mascarello & Perego, 2019). Vigor tests such as cold test, germination test, tetrazolium test and electrical conductivity test have been reported by several authors (Lazar, Mira, Pamfil, & Laborde, 2014; Rinaldi et al., 2017). Standard germination results are commonly used to predict field establishment, but standard germination often overestimates field establishment (Mwageni & Vanderlip, 1986). On the other hand, conductivity test has been validated as a rapid vigor test for peas (International Seed Testing Association [ISTA], 2009), and other works have shown the potential application of the conductivity test as vigor test in others crops (Mathews, Noli, Demir, Khajeh-Hossein, & Wenger, 2012; Lazar et al., 2014). However, conductivity test method remains to be developed and standardised for some plant species including some grain crops (Mathews & Powell, 2006). Limited documentation of both seed germination and electrical conductivity tests on millet seeds from three different regions has been done in Uganda. Yet, accurate vigor (tests) reveal the quality of seed and consequently the expected yield and quality of millet. This in a long run will ensure sustainable millet production, resilient food security and partly contribute to the attainment of sustainable development goal two.

2. Materials and methods

2.1. Study site and sample collection

The study was conducted in the laboratory at the Department of Agriculture, Kyambogo University in Uganda in 2020. Kyambogo University lies in the coordinates 00°20′54″N, 32°37′49″E. Finger millet seeds were picked from farmers in the districts of Nebbi in west Nile region, Lira in northern region and Soroti in eastern region. The seeds were then transported to the laboratory for analysis.

2.2. Experimental design and treatments

The experiment was setup as a Completely Randomized Design (CRD) with three replications. Finger millet seeds picked from the three districts i.e Nebbi, Lira, and Soroti constituted the treatments of the study.

2.3. Laboratory analysis

Seed moisture content determined was described as described by Kiplangat (2014). Electrolyte leakage was determined by placing 3 replicates of 0.1 g of finger millet seeds into 10 mLs of

deionised water at 25°C for each accession and conductivity of the medium determined with a conductivity meter (HANNA instruments, HI 8733 conductivity meter) (Lazar *et al*., 2014; Rinaldi *et al.,* 2017) in the interval of 24, 48 and 72hours respectively.

Germination test was done by placing 200 seeds replicated three times on top of moistened paper and incubating at 20-30^{o}C (ISTA, 2009). Data was recorded on germination percentage as follow:

$$\text{Germination percentage (Gp \%)} = \frac{\text{Total number of germinated seeds}}{\text{Total number of seeds planted}} \times 100 \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Also speed of germination (ISTA, 2009; Lazar *et al.,* 2014) and radical length was assessed as described by Ali and Abdellatif (2015):

$$\text{Speed of germination (SG)} = \frac{n1}{d1} + \frac{n2}{d2} + \frac{n3}{d3} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where n = number of germinated seeds and d = number of days.

2.4. Data analysis

Germination and electrical conductivity data was subjected to analysis of variance (ANOVA) of the Genstat. Means were separated using least significant difference (LSD) test at 5% level of significance.

3. Results and discussion

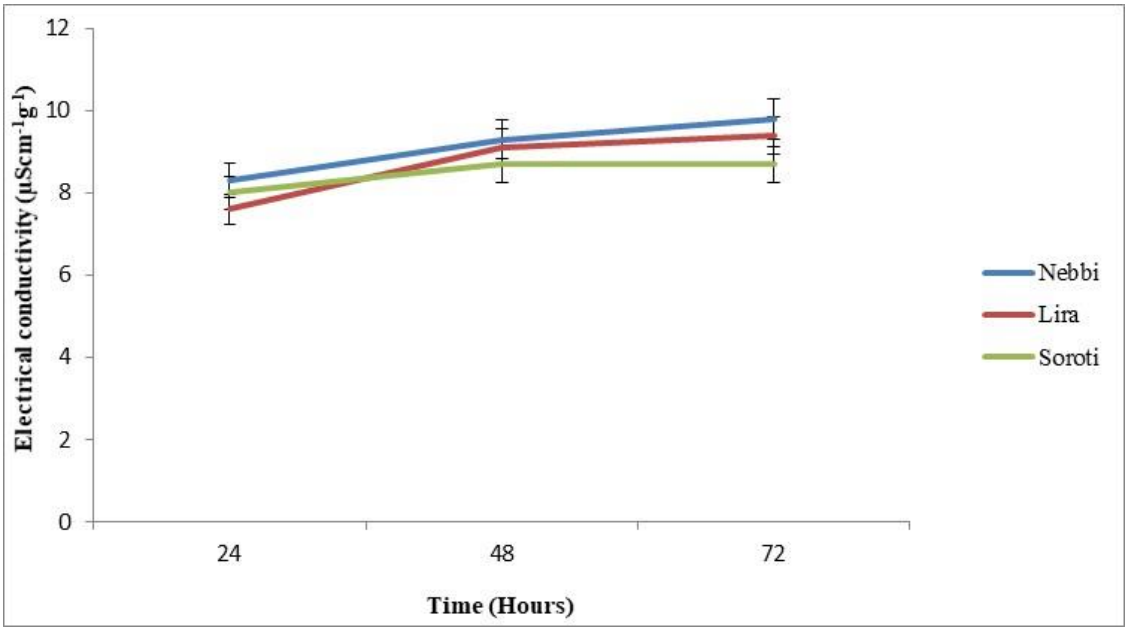
Results showed no significant ($p>0.05$) difference in the electrical conductivity of finger millet seeds from the three accessions (Table 1). In 24 hours after soaking, the electrical conductivity was 8.3, 7.6 and 8.0 $\mu Scm^{-1}g^{-1}$ in Nebbi, Lira and Soroti districts, respectively. Similarly, 48 hours after soaking, electrical conductivity was 9.3, 9.1 and 8.7 $\mu Scm^{-1}g^{-1}$ in Nebbi, Lira and Soroti districts respectively. Electrical conductivity in 72 hours after soaking followed a similar trend (Figure 1). No significant difference in electrical conductivity of the finger millet from three accessions was because of the same variety of millet seed. Additionally, it could be that the storage conditions and methods used by famers in the three accessions were similar implying that the membrane integrity of the seeds was similar. In fact, the low electrical conductivity of the seeds in this study implied that the membrane of the seeds was tougher hence prevented leaching of the seed's contents. Accordingly, the gradual increase in electrical conductivity of seeds with time was probably because of increased deterioration of seed membrane as a result of imbibition resulting into increased leachates. These results are consistent with several authors who reported that factors such as temperatures, storage condition, temperature, imbibition time and differences in electrolyte level in the variety affect electrical conductivity of seeds (Mathews & Powell, 2006; Lazar et al., 2014; Rinaldi et al., 2017). Kiplingat (2014) reported that finger millet seeds stored in tins and sack had low electrical conductivity that as compared to those stored above fire place. It's generally agreed that higher electrical conductivity values are indications of more leachates from seeds as a results of weak membranes hence seed low vigor and consequently low quality of seeds.

Table 1. Summary of ANOVA mean squares for electrical conductivity of finger millet seeds from three different accessions

		Time		
Source of variation	**Degrees of freedom**	**24 Hours**	**48 Hours**	**72 Hours**
Accession	2	0.25	0.27	0.64
F pro		NS	NS	NS

NS means not significant at $p<0.05$ Source: Own Calculation

Figure 1. Electrical conductivity of finger millet seeds from three different accessions



Error bars represent 5% value Source: Own Calculation

There was no significant ($p>0.05$) difference in the moisture content, germination percentage and germination speed of finger millet seeds picked from three different accessions (Table 2). Germination was 86.7, 81.7 and 91.7% in Nebbi, Lira and Soroti districts respectively (Figure 2). This was because of the same variety of millet seeds and probably similar storage conditions and methods used by famers in the three accessions. Storage conditions such as temperature, moisture content, light, genotypes or variety of seeds among others have been documented to account for similarities and/or differences in germination of seeds (Patil, 2018). Results of germination speed are presented in figure 3. Radical length presented in figure 4 followed a similar trend as germination speed. On average, the moisture content of the seeds from the three accession was 7.3% (Figure 5).

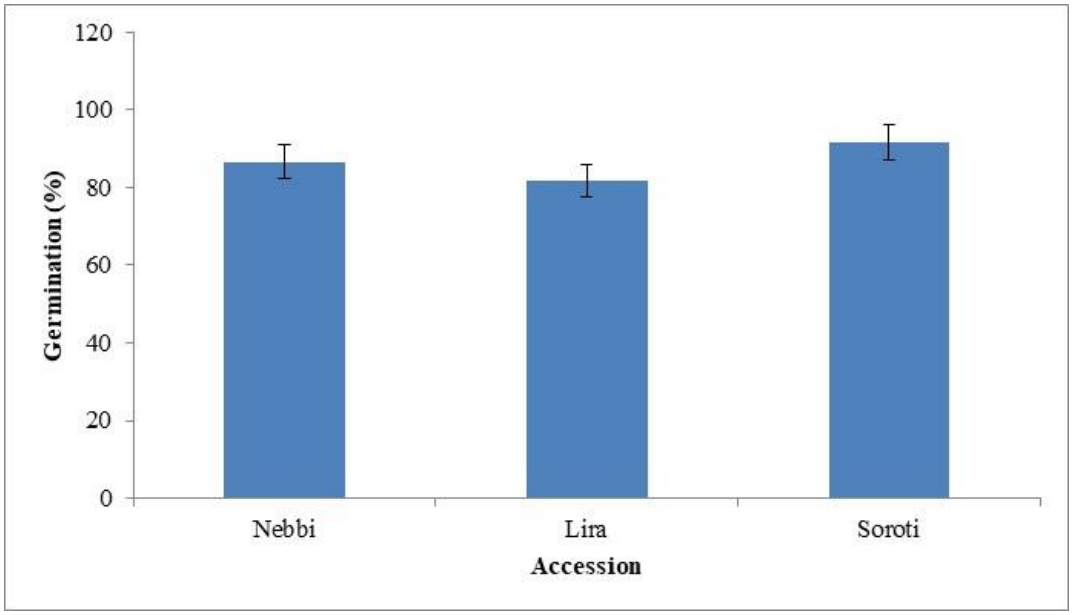
Overall, the consistency in the results of electrical conductivity and germination in this study confirms that electrical conductivity can be used as a rapid test for assessing millet seed quality as a higher germination (>80) and low electrical conductivity (<10 $\mu Scm^{-1}g^{-1}$) meant that they seed from the three accessions were of good quality. This agrees with a report Ocvirk, Spoljarevic, Markovic, Lisjak, Hanzer, and Teklic (2014) and Lazar *et al.* (2014) who reported that low electrical conductivity and higher germination percentage shows quality of seeds. Generally, Mathews & Powell (2006) reported that for maize and small- seeded crops, analysis of the single seed leachate conductivity could indicate both standard germination and seed vigor.

Table 2. Summary of ANOVA mean squares for moisture content and germination of finger millet seeds from three different accessions

Source of variation	Degrees of freedom	Moisture content	Germination percentage	Germination speed	Radical length
Accession	2	0.30	75.00	16.54	12.00
F pro		NS	NS	NS	NS

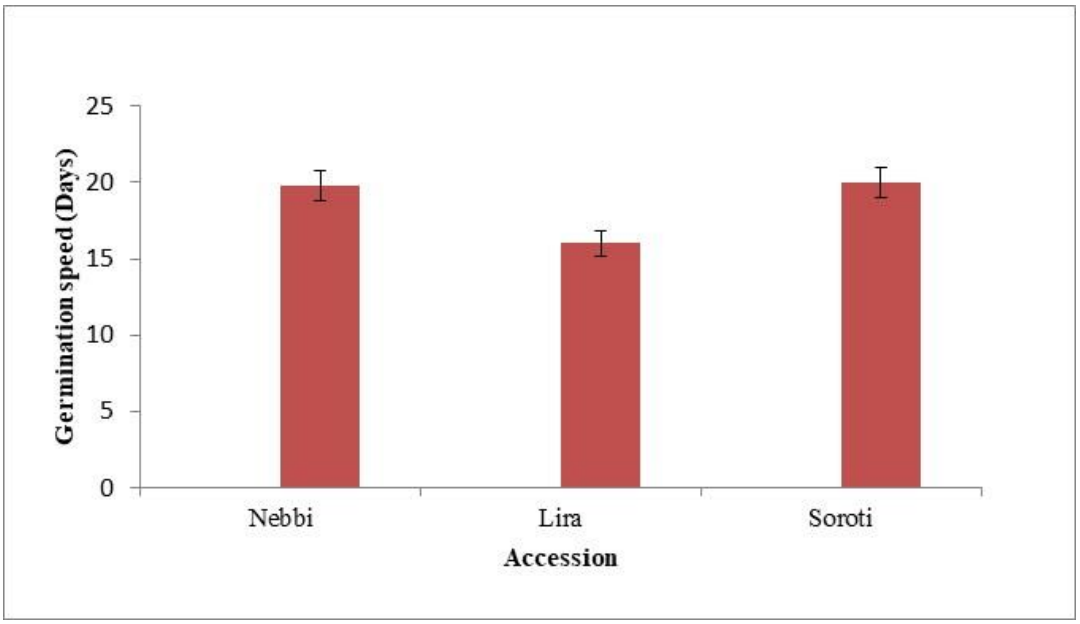
NS mean not significant at p<0.05 Source: Own Calculation

Figure 2. Germination percentage of finger millet seeds from three different accessions



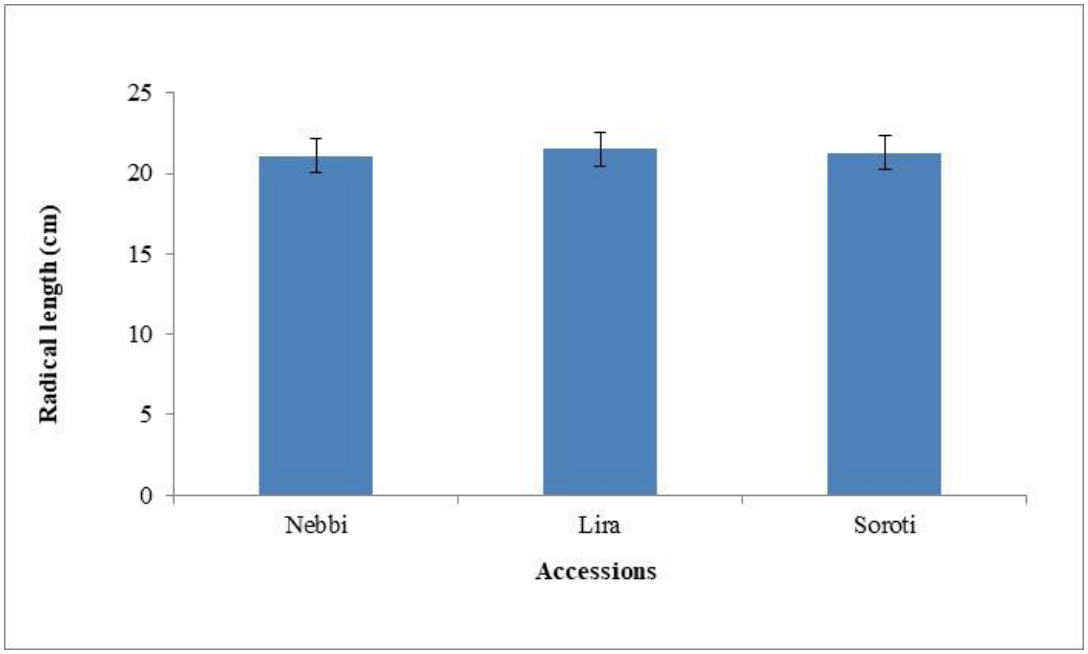
Source: Own Calculation

Figure 3. Germination speed of finger millet seeds from three different accessions



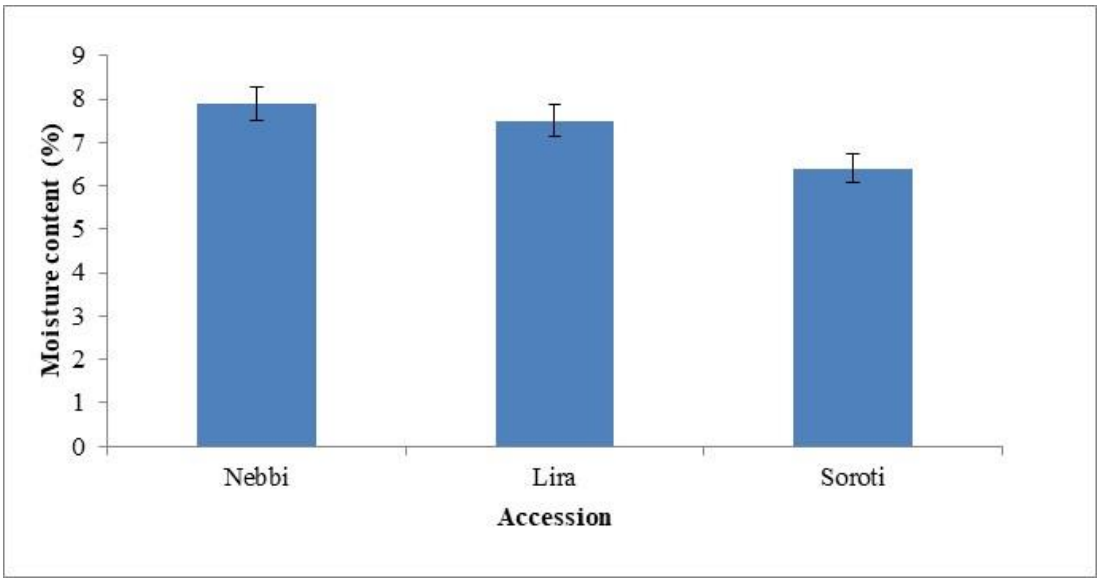
Source: Own Calculation

Figure 4: Radical length of finger millet seeds from three different accessions



Source: Own Calculation

Figure 5: Moisture content finger millet seeds from three different accessions



Source: Own Calculation

4. Conclusion

Both electrical conductivity and germination tests proved that the quality of millet seeds from the three accessions was good. However, additional studies with wider scope in terms of millet varieties and accessions is needed to validate the result of this study.

Acknowledgment

The authors appreciate the farmers from the three accessions for providing finger millet seeds used in this study.

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Current Situation of Milk Producers and their Needs for Upcoming Programming Period

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Abstract

Raw cow milk represents one of the most important commodity in the agricultural market. Consumption of dairy products by Slovak consumers is very low compared to other countries in European Union and the world what results in a negative impact on businesses in this sector. One of the main reasons is low demand of consumers. The aim of the article was to evaluate the current situation of and needs of milk producers in Slovakia in relation to the strategic objective - Farmer position in value chains. If we discuss the last 10 years, the Slovak sector of primary milk production has experienced three dairy crises. These crises caused that up to 37 % of milk producers cease their production. Despite the fact that by 2015 the milk market was regulated, milk supplies and milk purchase prices were on a swing. We know that Slovakia accounts for less than a percentage of European supplies but development on our market reflect to the situation on the European market. In 2019 the situation in primary milk production slightly improved mainly thanks to the recovery of milk purchase prices, but also thanks to support but still we cannot talk about big success. Milk purchase prices have recovered slightly and averaged 32.6 cents per kilogram over the year. On the other hand, costs have risen again, either because of rising energy prices or because of rising labour costs caused by the government measures. The dairy market situation is affected by changing climate conditions as well as demanding conditions for the marketing of dairy products.

Keywords: *milk, milk producers, common agricultural policy, milk consumption*

JEL Classification: *D24, E23, D78, H71*

1. Introduction

The raw cow milk can be classified as one of the most important commodities of the agrarian market. Besides that, the raw cow milk and dairy products play an important role in the human nutrition and health. Dairy products in general and especially milk, as their raw material, have a particular micronutrient composition. Milk has been naturally recognized as a privileged calcium source but in its mineral fraction, several other elements can be distinguished such as phosphorus, magnesium, zinc, and selenium (Gaucheron, 2011). Milk is generally considered an important protein source in the human diet. Milk as a high-quality resource of proteins of the animal origin, and the calcium content indispensable for the bone's creation (Matić et al. 2014; Gavurová et al. 2014). The cow milk is probably the most frequently consumed milk between people. Studies on milk consumption have shown a controversial and complex effect on human health. Milk as important macro and micronutrient sources has its irreplaceable role in healthy diets (Rice, Quann & Miller, 2013). The nutritional richness of milk is unquestionable; it is a good source of high biological value proteins with polyvalent roles in immune function, as well as nutrient transport and absorption and important vitamins and essential minerals (Pereira, 2014). The totality of available scientific evidence supports that intake of milk and dairy products contribute to meet nutrient recommendations and may protect against the most prevalent chronic diseases such as osteoporosis, cardiovascular diseases and type 2 diabetes.

The most recent evidence suggested that intake of milk and dairy products was associated with reduced risk of childhood obesity. In adults, intake of dairy products was shown to improve body composition and facilitate weight loss during energy restriction (Thorning, et al. 2016, Gulseven & Wohlgenant, 2017).

The dairy sector is very important for the economy of the EU. The EU is the largest producer of milk in the world, and it exports milk around the world (Hillerton & Berry, ,2004). Over the last 30 years, the Common Agricultural Policy (CAP) has strongly affected the European dairy sector's structure. Dairy production quotas were one of the iconic instruments of the CAP. They were implemented in 1984 in the face of dairy oversupply and low milk prices in the European Union (EU). Based on reference volumes from 1983, a quota was allocated to each Member State (MS) to control milk production, stabilize milk prices and producer incomes and reduce the European budget for market support (Barthélemy and David, 2001, JRC and IPTS, 2009, Salou et al., 2017).

The European Union (EU) dairy quota came to an end on 1 April 2015. This marked the latest of a series of Common Agricultural Policy (CAP) reforms, initiated more than a decade earlier, to bring EU dairy policy into line with other common market organisation schemes, with the aim of fostering a competitive export-oriented sector (Philippidis and Waschik, 2019).

The OECD-FAO Outlook present a scenario that world milk production is expected to grow at 1.7% p.a. faster than most other main agricultural commodities over the next decade (by 2028). On the other hand, production in the European Union, the second largest producer, is projected to grow more slowly than the world average. The European Union’s medium term growth is due to a small increase in domestic demand (cheese, butter, cream, and other products) as well as an increase in global demand for dairy products (OECD/FAO, 2019).

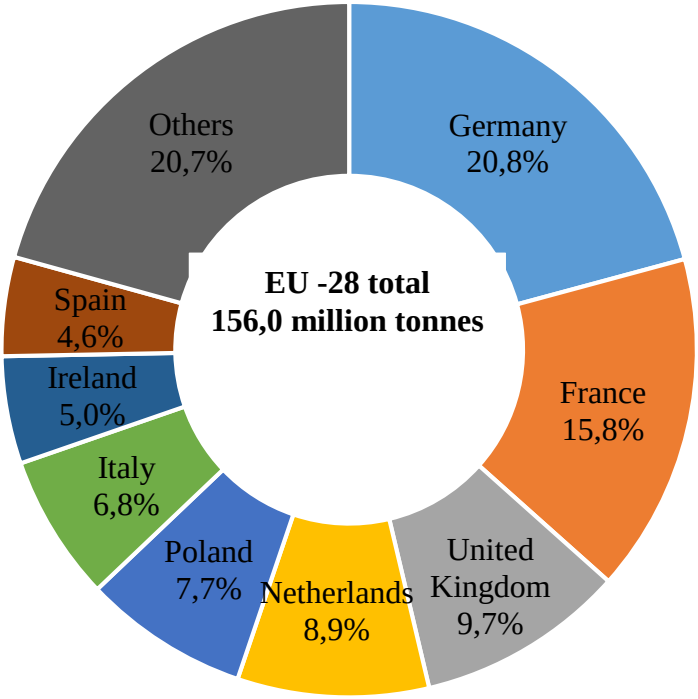
In Europe, milk output increased to 226.4 million tonnes in 2018, up 0.8 percent from 2017, with higher outputs in the European Union. Milk deliveries in the European Union reached 167.3 million tonnes, or about 1.7 million tonnes more, an increase of 1.0 percent from 2017. The rate of growth of output expansion could have been slightly higher if not for the 2018 summer drought that affected parts of Europe and the marginal decline of dairy herd numbers (FAO, 2019). Nowadays, the number of dairy cows in Europe has decreased as a result of an increased milk yield per cow (Nguyen, Hermansen and Mogensen, 2010).

The milk production has increased globally through increased milk yields and improved production efficiency, the reduction in the number of small dairy farms, and expansion of in dairy herd size (Krpalkova, et al., 2016). In Europe overall per capita demand for fresh dairy products is declining, but the composition of demand has been shifting over the last several years towards dairy fat, e.g. full-fat drinking milk and cream (OECD/FAO, 2019).

Across the 28 countries of the European Union, there are 700,000 dairy farms, 12,000 milk processing sites and more than 300,000 people working in the sector. The dairy sector is the industrial and societal backbone of rural Europe in the EU27 as much as in the UK. The UK dairy sector is an interlinked part of our EU dairy chain (EDA, 2020, Downing and Coe, 2018).

The EU produced 172.2 million tonnes of raw milk. The volume of raw milk produced in the EU was +0.9% higher in 2018 than in 2017. The production of raw milk on the EU's farms was a provisional 172.2 million tonnes in 2018, which represents a year-on-year increase of 1.6 million tonnes. This higher level of production can be put in some context by looking at production levels in the run-up to the abolition of quotas; EU farms produced 164.8 million tonnes of raw milk in 2014 and 159.0 million tonnes in 2013 (Eurostat,2019).

Figure 1. Collection of cows' milk by dairies, 2018



Source: Eurostat

In the above figure 1 we can see that in 2018, one-fifth of the EU's cows' milk was produced by farms in Germany and a similar proportion (20.8 %) was processed by German dairies. Indeed, just as Germany, France, the United Kingdom, the Netherlands, Poland and Italy together provided a little over two-thirds (68.5 %) of the raw cows' milk produced, so they also accounted for a little over two-thirds (69.7 %) of cows' milk collected by dairies (Eurostat, 2019).

Even though Slovakia in the EU- 27 belongs to the smallest milk producers we have to admit that we agree that the milk production is important for the society as a whole, both in terms of economy of state and the employment of rural population. It is a traditional economic sector, that due to its very favourable conditions promises a very viable future (Gurčík, et al. 2016).

Table 1.Development of milk production and milk yield over the period 2012-2018

	Year						
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Milk production (thousands of litres)	931 474	906 686	921 078	929 536	906 115	910 683	905 429
Average annual yield per cow (litres)	6 112	6 334	6 315	6 537	6 668	6 937	7 056

Source: Own processing based on data from the Statistical Office of the Slovak Republic - Public database DATAcube

Even though milk production in the reporting period fluctuates in Table 1 above, we can observe a positive development in milk yield, which is growing every year. In 2018 there was a year-on-year increase in milk yield by up to 119 l (2.7%) to 7 056 l milk per dairy cow per year, which represents the highest milk yield in the monitoring period so far.

2. Data and Methods

We developed a questionnaire, which was reviewed by an expert from the field. The questionnaire was distributed by e-mail, but mainly by personal inquiries. The questionnaires were systematically distributed among all milk producers in Slovakia. The survey was carried out in the months of September - November 2019. The survey was carried out in Slovakia.

The aim of the questionnaire research was to describe the current situation and identify the needs of milk producers. For this purpose, was used a questionnaire which consisted of two basic parts:

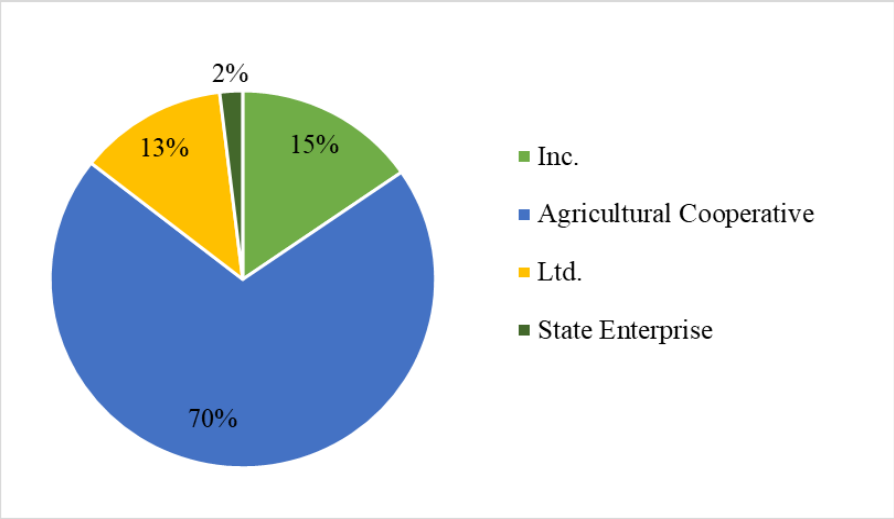
1. The current state of the milk producers in Slovakia.
2. Identification of the needs of the company in the new programming period CAP 2021-2027 in relation to the strategic objective - Farmer position in value chains of the prepared Strategic Plan

In order to fulfil the goal that was set, we chose a questionnaire survey as the main method. We chose this method mainly because the questionnaire generally represents a series of questions of various types submitted in writing or digital form. The questionnaire is easy to get information very quickly from a large number of people. In general, the advantage of the questionnaire survey is that it has low cost in time and money. The questionnaire is therefore a much more "economical" tool.

The criterion for establishing the survey sample were all the primary milk producers in Slovakia. Out of a total of 401 primary milk producers that process milk in Slovakia, we managed to reach 104 primary milk producers, which represents 27 % of the total number of respondents surveyed.

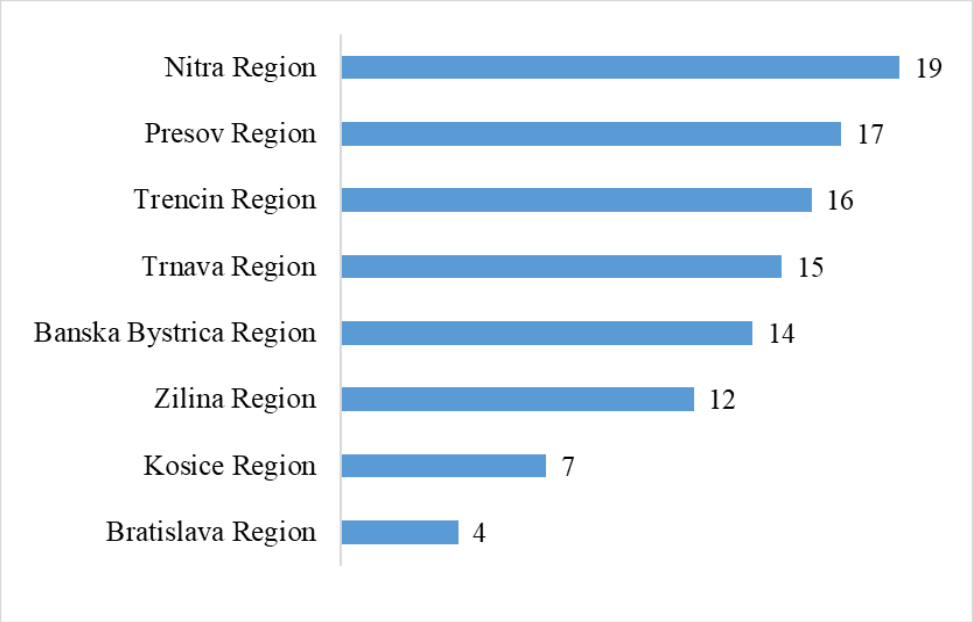
In the figure 2 below it can be seen that the largest share of respondents was from Nitra region and the largest share of respondents was agricultural cooperatives (70 %).

Figure 2. The legal form of the businesses of the respondents surveyed



Source: Own processing based on data from questionnaire survey conducted from September to November 2019

Figure 3. The regional representation of the respondents surveyed

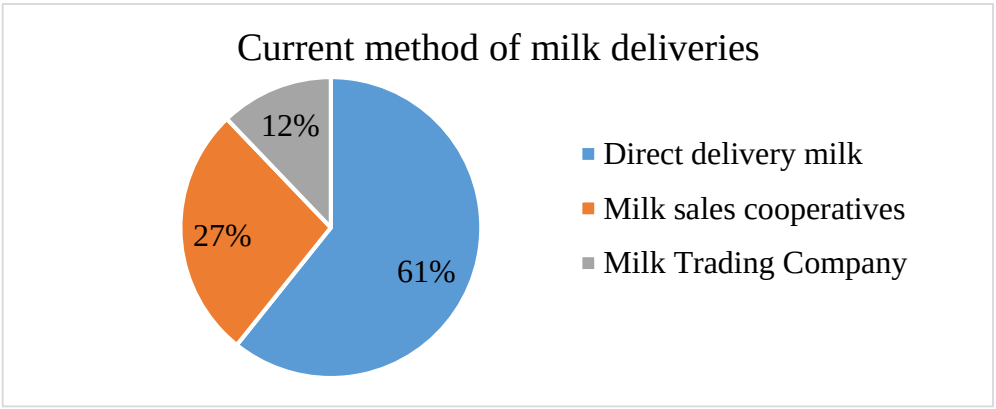


Source: Own processing based on data from questionnaire survey conducted from September to November 2019

3. Results and Discussion

Recent developments in European dairy policies and dairy markets are posing challenges for dairy cooperatives, because they are affecting interest alignment between milk producers and cooperative management (Bijman, and Hanisch, 2018). To address issues in the dairy sector and to discuss the need to increase the bargaining power of primary producers within the dairy value chain the European Commission introduced in 2012 new legislation called as "Milk Package". The Milk Package's objective is to strengthen the position of dairy producers in the dairy value chain and to prepare the sector to operate in a more market-driven environment, especially with the end of the quota system in 2015. Under this legislation, Member States have the option to make written contracts between milk producers and processors compulsory, whereas farmers have the possibility to negotiate contract terms, including prices and delivery conditions, collectively via recognized producer organization (Regulation (EU) No 261/2012; OJ L 94, 30.3.2012, p. 38., Wijnands, Bijman, & Tramnitzke, 2017).

Figure 4. Current method of milk deliveries



Source: Own processing based on data from questionnaire survey conducted from September to November 2019

In the Figure 4 above we can see that more than a half of the responders prefer direct deliveries of milk. Currently up 61 % of our sample deliver milk straight to processor. Nowadays, just minority of responders prefer some type of cooperation.

Dairy Sales Cooperatives has three main advantages especially for small farmers:

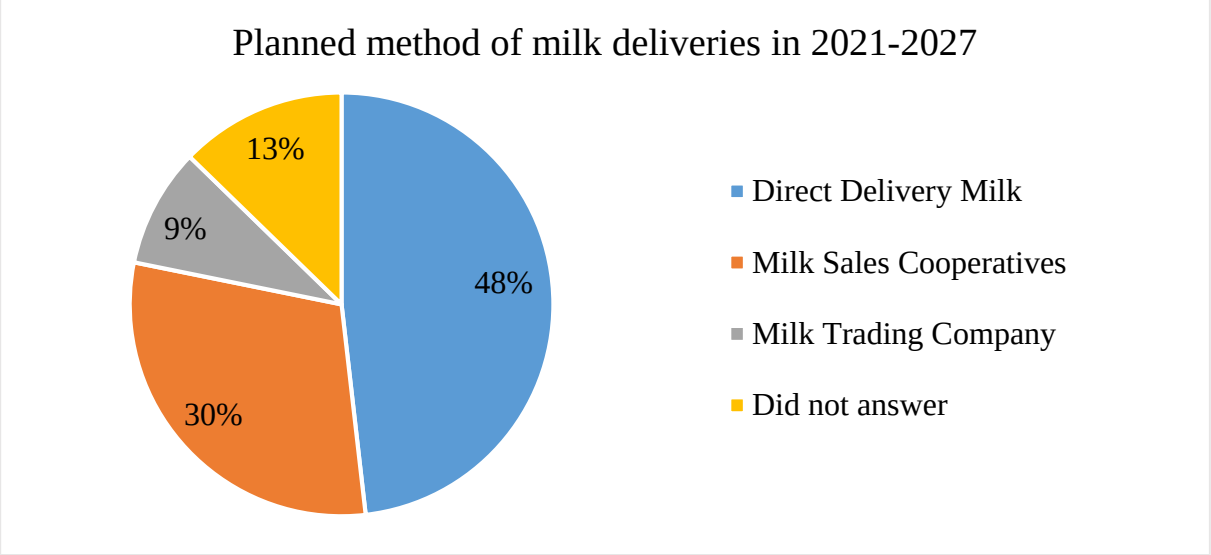
1. Dairy Farming Cooperatives Support the Industry by Balancing Production Costs.
2. Dairy Cooperatives Provide Consistent Pricing.
3. Cooperative Dairy Farming Can Provide Greater Control over Processing.

The management of these cooperatives is to ensure the negotiation of bargain purchase prices for all members. A farmer may be more concerned with his production than with a commercial activity. In general, these cooperatives have some market power, which is very difficult to obtain by the producer himself. Contribution of dairy cooperatives as option for market entry point for smallholder dairy producers may help develop the dairy sector (Tassew & Seifu, 2009).

The main reason for establishment of the Milk Trading Company is to develop a partnership with dairy farmers. The goal is to generate higher and more stable financial margins, using market information on the sale price for milk and the cost of feed inputs. Milk trading companies use different tools, such as the futures market, contracts with customers, price guarantee certificates and margin insurance. The milk trading companies usually maintain long-term relationships with several local dairy farmers' cooperatives to ensure stable and high-quality fresh milk supply. The biggest difference is in vertical cooperation. The three advantages of trading company are:

1. Secure, stable and long-term supply.
2. Access to high quality fresh milk.
3. Cooperative arrangement (Industry, 2017).

Figure 5. Planned method of milk deliveries in 2021-2027



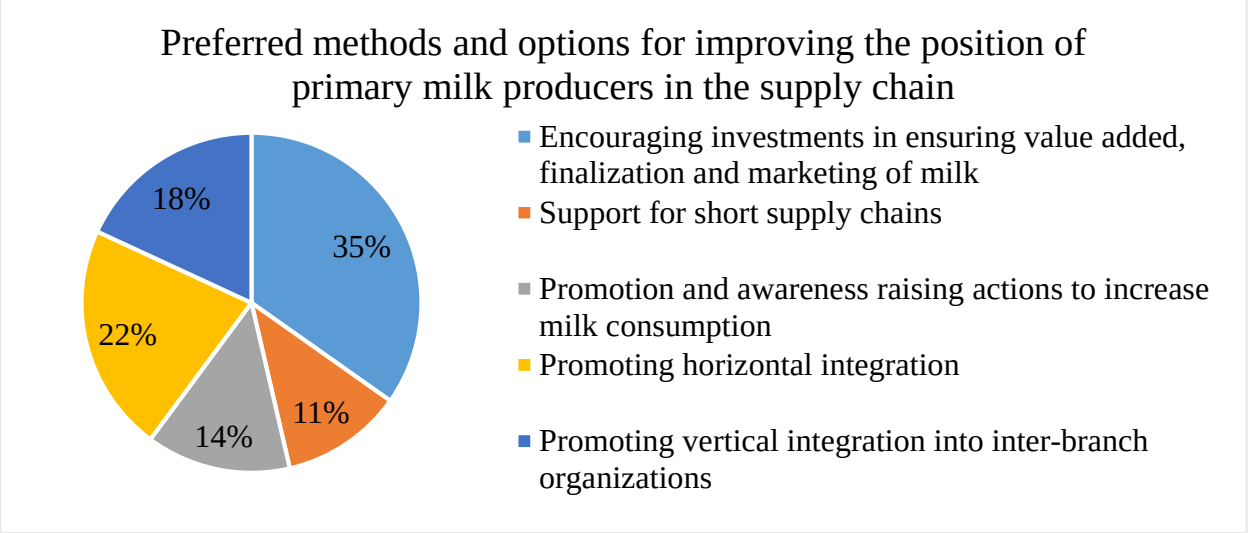
Source: Own processing based on data from questionnaire survey conducted from September to November 2019

In the context of the upcoming CAP programming period 2021-2027 we asked the responders if they plan to change the way how they deliver the milk. In the figure 5 above we can see that 13 % of milk producers is not yet decided. We can see the small increase in both - Milk Sales Cooperatives as well in Milk Trading Company, but despite od the fact that cooperatives have been a key organisation linking smallholder farmers to markets (Mazzarol et al., 2013, Ji et al.,

2017) in Slovakia milk producers prefer directly deliveries straight to processor as well in the upcoming CAP 2021-2027 (48 %).

Following this question, we want to know how milk producers want to improve their position in supply chain. In the figure 5 above we can see that the milk producers want to improve their position in supply chain by different ways.

Figure 6. Preferred methods and options for improving the position of primary milk producers in the supply chain



Source: Own processing based on data from questionnaire survey conducted from September to November 2019

Most respondents (35 %) see the position improvement in supply chain in encouraging investments. Investments realized in dairy farms enable the implementation of new technologies, and involve benefits associated with an increase in efficiency, a reduction in costs, an improvement in the quality of products and a reduction in the adverse impact on the environment, and an improvement in animal welfare (Bewley, 2010).

There is an abundance of literature on vertical integration but less on horizontal integration. The emphasis on horizontal integrations is no doubt heavily influenced by the dominance of the cooperatives in the dairy industries of the European countries concerned. Horizontal integration is a horizontal arrangement between many independent farmers. In our survey 22 % pf respondents see the possibility in improvement their position in supply chain in horizontal integration. On contrary, just 18 % of responders answered that vertical integration is the possibility for improvement of their position in supply chain. There are many good examples of use of vertical integration in many European countries. Vertical integration has the potential to both help the farmers and the dairy processing facilities survive in a complex and ever changing industry (Gilles, 2012). In general, we think that vertically coordinated agricultural formation can improve the competitiveness of dairy production.

In addition to policy changes, dairy farmers and dairy cooperatives have experienced a number of major changes in market environment over the past decade, and most of these changes will not simply pass by but, rather, continue to affect the dairy industry in the near future. The three major changes were identified in market conditions – increasing volatility in dairy markets, changing consumer preferences, and ongoing concentration in dairy value chains (Bijman & Hanisch, 2018).

The demand for milk has been changing with people consuming less milk per capita worldwide. One of the biggest threats to milk production is the increase in demand for soymilk (soy drink) as an alternative to cow-based milk. (Bórawski, et al., 2020). In figure 6 we can see

that 14 % of responders see this threat. This sector need to raise the awareness about health benefits of milk to increase milk consumption.

4. Conclusion

In recent years, the volume of milk production has constantly been growing, which indicates the growing importance of this agri-food sector in the EU market. Despite of this positive situation on EU market we need to bear in mind that the price of milk is highly volatile, and the demand for milk has been changing.

Even though the raw cow milk and dairy products play an important role in the human nutrition and health the consumption of dairy products by Slovak consumers is very low compared to other countries in EU and the world. Low demand of consumers, changing condition on the market and climate impacts results in a negative impact on businesses in this sector.

We need to focus on changing consumer preferences in Slovakia with concentration on support of milk consumption. It is important to build good relationships with consumers and promote health benefits of milk. The education and advertisement should play an important role in consumption of milk.

Slovakia's Union of Milk Primary Producers (SZPM) together with the milk processors' Dairy Union (SMZ) launched a Dairy Fund, which associates more than 570 Slovak milk producers and processing companies to help increase milk consumption in Slovakia. We need to focus as well on vertical integration and support investment into the dairy sector. In the upcoming programming period of the CAP 2021 – 2027 Slovakia need government, which will stabilize this sector, which is long time investment-undersized and is very labour intensive.

Acknowledgements

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Challenges of E-Government in Ethiopia

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Abstract

E_ government is the application of information and communication technologies to deliver effective and efficient public service delivery through using different electronic means like internet, worldwide webs, smart cards, and telephone touch pads etc. Therefore, the objective of this paper is analyzing challenges and practice of E government in Ethiopia. Even if the topic is in Ethiopian case, the paper tried to highlight the general African E-government practice and experience. To analyze this paper different sources were employed like peer reviewed journals, international organization documents and different links. Moreover, Ethiopia adopted since 2002 ICT draft policy but there some challenges impede the successful implementation of the polices like ICT infrastructural problem, managerial problem, inadequate skilled manpower, rules and regulation and budget and other challenges are some of them and these are common challenges facing in most of developing countries including Ethiopia. Finally, to tackle these challenges, the government of Ethiopia should apply a comprehensive and coordinated policy approach to mitigate the aforementioned challenges.

Keywords: *E-government, Ethiopia, E-government development index, E-government in Africa, ICT*

1. Introduction

E-Government (or electronic government) can be defined as the "use of information and communication technologies to offer citizens and businesses the opportunity to interact and conduct business with government by using different electronic media such as world wide web, telephone touch pad, fax, smart cards, self-service kiosks, e-mail / Internet, and EDI" (Almarabeh & AbuAli, 2010). In its simplest form, it is the application of information and communication technologies (ICTs) to deliver public services and decision-making (Holmes, 2001). To this effect, e-government can be viewed as the management, rules, regulations, and frameworks organized by a government for service delivery as well as to communicate, co-ordinate and integrate processes within itself (Almarabeh and AbuAli, 2010 and Nkohkwo, & Islam, 2013). The reason for the sudden rise in e-government practices in the contemporary world and the same time in Ethiopia is due to the fact that e- government systems have the capability of fostering efficient and effective governance (OECD, 2003). e-Government helps in achieving greater efficiency in government performance by raising service performance, and service delivery, by eliminating inefficient processes and reducing bottlenecks and red tape in the service delivery process as much as possible (Mutula, 2008). Furthermore, it is important to note that e-government initiatives are also aimed at improving government service delivery and citizen participation. In addition, most of the times the need for e-government is driven by a country's need for rationalization since e-government is considered to be cheaper, fewer people are needed to do the work and convenience (Nkohkwo, & Islam, 2013)

The world over, there has been a paradigm shift where governments have realized the importance of e-government as a strong tool for public-sector reform in search of excellence. Governments have understood and appreciated the contribution of e-government to the government agenda in contrast to the traditional paper-and-file approaches often adopted in managing businesses and another administrative issues (Guma 2013).

Over the last decade, a lot of effort has been made to improve the use of Information and Communication Technology (ICT) in developing counties. International organizations such as

the International Telecommunication Union (ITU) and the United Nations provide strategic guidance to overcome challenges of ICT use. Capacity building has been used as a strategic means to share ICT knowledge through the national and international community (ITU, 2016). Yet, the development of ICT use in developing countries is still very low. Many projects have been established but few have been successful (Heeks, 2006). As a result, the development of ICT deployment does not meet the expected goals, especially in developing countries including my country Ethiopia. Currently there is huge difference of ICT setting compared to the world average. Data shows that internet penetration in developing countries (7% of the households) compares low to the world average 46% (ITU, 2015). Studies show that failures are caused in particular by insufficient customer requirements and project specification (Tohidi, 2011; Montequin et al., 2014). Also, requirement engineering is largely ignored in the development of e-government solution (Alexandrova, Rapanotti and Meehan, 2011). Both findings are strongly related to insufficient stakeholder involvement during the initial phase of project implementation (Elkadi, 2013; Montequin et al., 2014). As a result, the projects do not conform to requirements and lead to slow down e-government implementation and development efforts Yonazi, 2010, (cited in Khamis, and Weide, 2017).

1.1. Types of e-Government

There are different types of e-Government based on using ICT to facilitate relationships between government and other key stakeholders. The types of relationships are with citizens (G2C – Government-to-Citizen), business (G2B – Government-to-Business), other governments (G2G – Government-to-Government), and employees (G2E – Government-to-Employees). Other studies refine these categories into smaller sub-categories. According to Gant, 2008 this report will use these categories to describe the different types of e-Government services.

1.2. Government-to-Citizen e-Government Approach

Government-to-Citizen e-Government focuses on making information accessible to citizens online. This is referred to as a citizen-centric e-Government when governments take further steps to provide online services organized around citizen needs. Many early designs of e-Government web sites organized the content, particularly the hyperlinks to government services, around the pre-existing structure of the ministry and its bureaucratic procedures. This proved to confuse citizens. Citizens would spend time searching to find information through a labyrinth of web pages that mirrored the organization and structure of the ministry. Since most citizens do not understand how the internal operations of a government ministry functions, the bureau-centric organization of a government web site caused greater levels of dissatisfaction with early e-Government sites.

2. Government-to-Business e-Government Approach

Government-to-Business e-Government focuses on strategies using ICTs to facilitate government interactions with the private sector to procure goods and services and to coordinate transactions from private companies. One approach is known as electronic procurement (e-procurement). Because of the large number of purchases that governments make from the private sector, there is a need to develop faster and more cost-effective routines to handle the typical procedures for procurement. The typical tasks include material planning, sourcing, purchasing and contract management (UNESCAP 2006). E-procurement systems streamline

the process of purchasing goods and services from the private sector through ICTs. E-procurement systems provide electronic catalogs or marketplaces to streamline online ordering and payment, announce calls for tender through electronic tendering solutions, and support online bidding (Moon 2002). Governments put e-procurement systems in place to improve document management, reduce costs, reduce processing times, improve access to markets for goods and services, and increase transparency of public decision-making.

3. Government-to-Employee and Government-to-Government e-Government Approaches

Government-to-Employee e-Government focuses on relationships within government among employees to coordinate internal operations and improve the internal efficiency of business processes. Very closely related, Government-to-Government e-Government focuses on providing services to governments through intergovernmental relations. This includes activities to coordinate stakeholders from the national, state/provincial, and local government as in the case of humanitarian or crisis response (Gant, 2008). Generally, the aim of this paper is to analyze the challenges that confronts in implementation of e government in Ethiopia. To analyze this paper data collected from secondary sources for instance peer reviewed journals, international organizations databases and other links.

4. Overview of E- Government in Africa

Africa is the second largest continent with about a fifth of the world's total land area and the second most populous continent with one-seventh (about 950 million) of the world's population (Burke, 2012). Africa was once labeled a technological desert with respect to technology adoption and use of the output of the technology (Ramessur, 2009). However, in the last decade, African governments have followed the trends towards adopting e government with the objective of enhancing free flow of information, citizens' participation in the public policy processes like agenda setting, drafting, and implementing, promoting productivity among the civil servants, and improving the delivery of public services (Njuru, 2011). This is witnessed by the initiation of several e-government initiatives across the continent and east Africa including web sites and portals that promote reasonable access to government information and services by citizens and businesses (Rorrissa and Demissie, 2009). Furthermore, Africa has been one of the most dynamic regions in terms of ICT growth over the last decade; thus, it is in this context that e-government in Africa has evolved (Burke, 2012 and Fonou, et al 2014).

According to the United Nations E-government report 2020 in in World, most countries (61 percent) is in the middle EGDI group; still, the number of countries in the high EGDI group has nearly doubled since 2018, improving from 8 to 14 and now holding for 26 percent of the region. Four countries in Africa — Mauritius, Seychelles, South Africa, and Tunisia — have EGDI values that are above the global normal (ranging from 0.6526 to0.7196) and are leading the African region in terms of e-government development index, and Ethiopia from East Africa in the middle EGDI group as far as HCI high and low TII. Significant progress has also been made in reducing the number of countries in the low EGDI group (from 13 to 7 between 2018 and 2020); the seven countries in this order (Central African Republic, Chad, Eritrea, Guinea-Bissau, Niger, Somalia, and South Sudan) are each low- income countries in conflict, and fragile States. Thus, in Africa, seven countries moved from the low to the middle EGDI group (Sudan, Mali, Mauritania, Comoros, Djibouti, Guinea, and Equatorial Guinea), and eight moved from the middle to the high EGDI group (Namibia, Cabo Verde, Egypt, Gabon, Botswana, Kenya,

Algeria, and Zimbabwe) (United Nations, 2020). And Ethiopia is among the least EGDI and ranked 178th among 193 countries around the world according to United Nations report 2020.

Table 1. African countries with the highest EGDI value. Top countries for E-government in Africa

S.no	Country	Rating classes	EGDI rank	Sub region	OSL value	HCI value	TII value	EGDI (2020)	EGDI 2018
1.	Mauritius	HV	63	Western Africa	0.7000	0.7911	0.6677	0.7196	0.6678
2.	Seychelles	H3	76	Western Africa	0.6176	0.7660	0.6925	0.6920	0.6163
3.	S Africa	H3	78	Southern Africa	0.7471	0.737	0.5832	0.6891	0.6618
4.	Tunisia	H3	91	Northern Africa	0.6235	0.6974	0.6369	0.6526	0.6254
5.	Ghana	H2	101	Western Africa	0.6353	0.5930	0.5596	0.5960	0.539
6.	Namibia	H2	104	Southern Africa	0.5235	0.6558	0.5447	0.5747	0.4554
7.	Morocco	H2	106	Northern Africa	0.5235	0.6152	0.5800	0.5729	0.5214
8.	Cabo Verde	H2	110	Western Africa	0.5000	0.6337	0.5476	0.5604	0.498
9.	Egypt	H1	111	Northern Africa	0.5706	0.6192	0.4683	0.4683	0.4683
10.	Gabon	H1	113	Western Africa	0.3235	0.6719	0.6250	0.5401	0.4313
11.	Botswana	H1	115	Eastern Africa	0.3647	0.6911	0.5591	0.5383	0.42530
12.	Kenya	H1	116	Eastern Africa	0.6765	0.5812	0.3402	0.5326	0.4541
13.	Algeria	H1	120	Northern Africa	0.2765	0.2765	0.5787	0.5173	0.4227
14.	Zimbabwe	H1	126	Eastern Africa	0.5235	0.6135	0.3688	0.5019	0.36920.
15.	Ethiopia	M1	178	Eastern Africa	0.3647	0.3378	0.1194	0.274	0.3094

Source:(United Nations, 2020)

5. E-government practice in Ethiopia

The national ICT policy clearly stated that the government envisions advancing "the social and economic well-being of the peoples of Ethiopia through the exploitation of the opportunities created by ICT for achieving rapid and sustainable socio-economic development, and for sustaining a robust democratic system and good governance in the country cited in (Alehegne, 2014)."

The Ethiopian government's broader reform measures have mostly focused on restructuring and administrative process reengineering. Likewise, the incumbent has begun certain steps to help the CSRP by embracing the E-Government system. The primary areas in this regard were the formulation of the National ICT Policy and the Woreda Net Project.

The process of drafting the national ICT policy has started since 2002. And as indicated in the policy, E-Government is one of the thirteen strategic focus areas of the ICT intervention. Aiming at delivering efficient and effective public service, the government has set different strategies and objectives that are important for the adoption of the E-Government system(Mekuriya, 2009). The Woreda Net Project, for example, was deemed to be the most significant achievement in terms of delivering E-Government service. The project's main goal was to establish a broadband internet link between the federal, state, and local governments in order to provide internet protocol (IP) services using VSAT technology. As a result of the project, more than 620 local governments have been connected to one another via network infrastructure and have begun to get telecom services such as the Internet, Messaging and Directory, and Video Conferencing. In addition, around 668 high schools and 183 preparatory schools have internet connection. However, still high schools and preparatory internet connection is inefficient and ineffective due to the different problems particularly in remote areas. Furthermore, due the project commencement since 2002 some federal civil service organizations and most NGOs are benefiting from the E government service (Mekuriya, 2009). At 72nd place globally, Ethiopia is one of the best performing LDCs in online service delivery,

ahead of many wealthier countries, including a number of European nations. The country's success can be traced in part to high-level recognition of the need to coordinate online services at national level, provide a strategic direction for e-government development in the country and allocate sufficient resources. The national strategy includes provisions for citizen centric mechanisms for stakeholder involvement, implementation of 219 online services over a five-year period from 2011–2015, tracking of indicators of achievement and establishment of a national e-government leadership council. The strategy is linked to the country's national development strategy that envisages a transformation from a primarily agricultural to an ICT-based economy. Despite the country's status as a low-income, landlocked, conflict-affected country, Ethiopia's achievements demonstrate that a vibrant online public administration can emerge from a combination of high-level political commitment, engagement of stakeholders and a specific plan of action linking e-government to national sustainable development priorities(Vincenzo Aquaro, Elia Armstrong, Wai Min Kwok, Patrick Spearing, Adriana Alberti, Seema Hafeez, 2014).

Table 2. E-government development index Since 2003 In Ethiopia

2020 Ethiopia	2020	2018	2016	2014	2012	2010	2008	2006	2004	2003
E- government development index rank	178	151	157	157	172	172	172	171	170	166
E government development index value	0.274	0.3463	0.26655	0.259	0.23058	0.2033	0.1857	0.136	0.136	0.1277
E participation index rank	148	101	91	122	45	135	170	151	151	102
E participation index value	0.3333	0.573	0.49153	0.255	0.3421	0.0429	0	0	0	0.0345
Online index value	0.3647	0.6319	0.52899	0.457	0.47058	0.2	0.1739	0.0154	0.027	0.0306
Telecommunication in infrastructure index value	0.1194	0.0976	0.0495	0.027	0.0093	0.0073	0.004	0.0027	0.002	0.0026
Human capital index value	0.3378	0.3094	0.22117	0.293	0.21185	0.4027	0.3796	0.39	0.38	0.35

Source: 2020 United Nations E-government survey

The center has been ranking countries on annual bases since 2001. The center study report of 2020 documented the evaluation of national government websites in 193 countries. In this study again, the E-Government development index of Ethiopia is among the least performed countries i.e., 178 of 193 countries 0.2740 in E- development index and 0.333 E. participation index and rank 148 of 193 from world countries in 2020 united nations report.

The government is at present day operating e-government program at ministry level with vision 2025: "to realize the economic growth of Ethiopia and provide affordable & quality services to all Stakeholders thereby to deliver effective, efficient and transparent service and assure good governance, through innovation in everything we do, creating a culture of entrepreneurship, affecting the lives of all Ethiopians and Leveraging SMART government initiatives." (MINT, strategy: p34).

Ethiopia initiated strategic plan that configuration keeping the accompanying core values or guiding principles of e-government stipulated as follows

- E-government is focused in making a SMART (Simple Moral Accountable, Responsive and Transparent) Government.
- E-government advances reasons for e-resident and e-majority rule government.
- E-government isn't interpreting forms, anyway changing procedures.
- E-government requires capacity working inside the government.
- E-government points organized and coordinated government.
- E-government is native driven.
- E-government gives multi-channel conveyance of open administrations. And
- E-government bolsters being developed and consideration of private sector in open administration conveyance. (MICT, 2013) cited in (Alehegne, 2014).

6. Challenges of E-government in Ethiopia

Implementation of e-government can improve the government's services to their stakeholders, especially for developing countries like Ethiopia. The top three benefits of e-government for stakeholder groups/roles are: easy to use, accessibility and inclusivity, and confidentiality and privacy. However, challenges in e-government implementation can make the projects fail. The failure either fails or cannot meet the expected outcomes of e-government initiatives is more than 60 percent. The analyst estimates that from more than 40% e government implementation projects in developing or transitional countries, 35% were total failures, 50% partially failed, and only 15% were successes. The failure rate is higher in developing countries because of many challenges faced by the government (Meiyanti et al., 2019). In developing countries including Ethiopia different models and approaches have been implemented to make sure these ideas succeed. Unfortunately, the strategies, approaches, policies, and experiences from advanced countries might not be directly applicable to developing transitional countries due to the technological, infrastructural, and social conditions. In Ethiopia the E-Government effort has made a promising start, but there are still numerous obstacles to overcome.

First, interconnection and cross-sectoral connectedness are still in their infancy. CSCs are only found in cities, leaving the majority of the people without access to them (85 percent of the population). Despite having nearly doubled since 2012, mobile service penetration in the country remains at 44 percent, well behind the Sub-Saharan African average of 53 percent. Telecommunications, in general, and internet access, in particular, are prohibitively expensive for the majority of the population(Denbu & Kim, 2019).

Second Intra-organizational connectivity is another challenge. On the national portal, Ethiopia has introduced 168 services. All the services, however, are delivered by various government offices that are not integrated. Inefficient service delivery has arisen from a lack of integration between the institutions, as a client had to visit different government agencies to get service. This adds another degree of complexity to the already complex bureaucratic system used by the vast majority of government agencies. Currently, the Ministry of Communication and Information Technology (MICT) serves as an intermediary between ministries, but it has no control over proposals(Denbu & Kim, 2019).

According to the studies (Meiyanti et al., 2019) conducted on the challenges of E government in developing countries, among the challenges, the most common challenges are summarized as follows:

- IT Infrastructure

Leaders' lack of technological skills
Lack of technological skills among employees
Lack of technological skills among citizens
Inadequate digitalized information
Lack of Integration Systems

- Managerial Issues

Well care from the top of the pyramid in the administrative state
Workforce and Resistance of Change
Lack of Transparency

- Digital Culture

Lack of Awareness
Lack of Trust
Laws And Legislation
Updated to recognize electronic documents and transactions
Policies support rather than impede e-government
Lack of UpToDate legal and regulatory framework that can go in line with new technologies

- Budgeting

Lack of budget in general
Lack of funding sources
a failure to control the available resources
Corruption and misuse public money

7. Conclusion

The appropriate application and implementation of e-government can improve the government's services deliver to their stakeholders, and to assure sustainable development especially for developing countries like Ethiopia. The top benefits of e-government for stakeholder groups/roles are easy to use, accessibility and inclusivity, and confidentiality and privacy to stimulate good governance in country. However, due to the aforementioned, challenges in Ethiopia particularly e-government implementation can make the projects fail.

Therefore, to overcome these challenges, the government of Ethiopia should apply a comprehensive and coordinated policy approach. e-Government policies must be established with a citizen-centric approach, and they must be led by a thorough planning guide. Evaluation of e-government initiatives on a regular and recurring basis is a fundamental requirement for success. And it should enhance the websites by regularly regulating and updating them, as well as improving data and system quality.

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