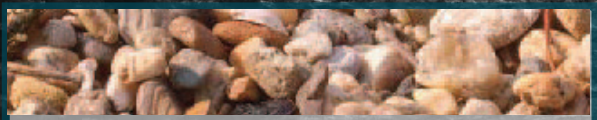
Dunakavics

A Dunaújvárosi Egyetem online folyóirata 2025. XIII. évfolyam V. szám

Műszaki-, Informatikai és Társadalomtudományok



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TAMÁS KŐKUTI *

The role of artificial intelligence in sustainability topics

Abstract: Artificial intelligence is a major focus of attention today. As the technological advances brought about by these developments become more widespread, the potential for their application in all areas of the economy, society and nature has been growing. The processes outlined above, the changes brought about by technological and technical progress, are having an increasingly marked impact on all aspects of our lives. This expansion also raises significant sustainability issues.
This study will explore the questions and possible answers that are now on everyone's minds in relation to these developments.
With the rise of artificial intelligence, how sustainable will the economy, society and nature be? How will the emergence of artificial intelligence affect economic, social and environmental aspects? Will AI be able to support sustainability or should other impacts be taken into account, such as the energy hunger of the new technology? In which areas can AI be most effective? We are seeking answers to these questions by exploring the views of students at our university.
Keywords: Artificial intelligence, sustainability, application advantages, disadvantages.

Összefoglalás: A mesterséges intelligencia napjainkban kitüntetett figyelmet élvez. A fejlődés okozta technológiai vívmányok egyre szélesebb körű térnyerése, alkalmazásának lehetőségei a gazdaság, a társadalom és természet minden területén megjelentek. A felvázolt folyamatok technológiai, technikai fejlődés okozta változások egyre markánsabban érzékeltetik hatásukat életünk minden szegmensében. A térnyerés következtében markáns fenntarthatósági kérdések is felvetődnek. A tanulmány kitér azokra a kérdésekre és a lehetséges válaszokra, amelyek napjainkban mindenkit foglalkoztatnak ezekkel a fejlesztésekkel kapcsolatban.

* *University of Dunaújváros, Institute of Social Sciences*
Email: kokutit@uniduna.hu

A mesterséges intelligencia térnyerésével vajon mennyire lesz a gazdaság, a társadalom, a természet fenntartható? Hogyan alakulnak a mesterséges intelligencia megjelenésével a gazdasági, a szociális és környezeti szempontok? Vajon képes lesz támogatni a mesterséges intelligencia a fenntarthatóságot, vagy egyéb hatásait is érdemes figyelembe venni, mint például az új technológia energiaéhsége? Milyen területeken lehet a leghatékonyabb a mesterséges intelligencia? Kutatásunk kérdéseire egyetemünk hallgatói véleményét is feltárva keressük a válaszokat.
Kulcsszavak: Mesterséges intelligencia, fenntarthatóság, alkalmazási előnyök és hátrányok.

Introduction

On a global level, the development of artificial intelligence (hereinafter: AI) has become a new competitive factor. The waves of change stimulated by technological development are not abating, in fact, according to some forecasts, they will transform our future to such an extent that within 40 years, smart machines will be able to perform all work tasks currently performed by human resources, and they will do it all more economically and to a higher standard [1]. AI can support a sustainable economy in several areas. It can help optimize energy consumption in both industry and households with the help of smart grids. The importance of this also increases with the magnitude of the increasingly dominant domestic solar energy production. In the case of agriculture, AI may be able to pre-plan optimal irrigation by studying weather patterns. It can also support selective recycling in waste management. AI is able to manage the traffic load of the settlements through prevention [2]. In the case of sustainable economic decisions, it can support the operation of the companies concerned with continuous monitoring. Large technology companies are already offering economic players solutions that not only measure their carbon dioxide emissions, but also allow them to optimally plan their carbon emissions [3].

The operational elements that can be converted into data sets can be found in AI patterns. It can solve complex tasks based on evaluation trends from a lot of data. The operation of large settlements can be described with a lot of data, and by analyzing this, the planning of cities that are currently being built can result in optimally localized infrastructural solutions from the point of view of the community, but the redesign of existing settlements can also be supported [4].

[1] Berger, R. (2022): *Focus. The digital dilemma. Why companies struggle to master digital transformation.* https://content.rolandberger.com/hubfs/07_presse/Roland_Berger_Focus_Digital_Dilemma_N3XT_2022.pdf

[2] Jóźwiak, P.–Falus, O. (2022): Legal Regulations on Autonomous Vehicles in Poland and Hungary: The Issue of Criminal Liability In: Balázs László–Rajcsányi-Molnár Mónika–András István (Eds.): *Elektromobilitás és társadalom.* Dunaújváros: DUE Press, pp. 125–136.

[3] Chikán A. (2023): Fenntarthatóság a mesterséges intelligencia korában. *CHIKANSPLANET.* (21 April, 2023) https://chikansplanet

[4] Sanchez, T. W.–Brenman, M.–Ye, X. (2024): The Ethical Concerns of Artificial Intelligence in Urban Planning. *Journal of the American Planning Association,* 2., pp. 1–14.

AI requires enormous computing capacity, which has hindered its development for a long time. This demand also induces a high energy demand. So this operation also has an ecological footprint, which we usually don't talk about [5].

Legal background and recent regulations on the use of AI in the field

Although the EU has made the development of AI a top priority, it also draws attention to the dangers of its use. It is also considered necessary to take risks into account, which resulted in drafting legislation to this end.

The purpose of the AI Act is to set clear requirements and obligations for AI developers and users with regard to the different uses of AI. It also aims to reduce the administrative and financial burden on businesses, in particular small and medium-sized enterprises (SMEs).

The AI Act is the first comprehensive legal framework for AI worldwide. AI legislation will ensure that Europeans can have confidence in what AI has to offer.
The proposed rules are:
– Managing the risks created specifically by artificial intelligence applications;
– Ban AI practices that pose unacceptable risks;
– Define a list of high-risk applications;
– Set clear requirements for AI systems used for high-risk applications;
– Define specific obligations for users and providers of high-risk AI applications;
– Require conformity assessment before placing an MI system in service or placing it on the market;
– Implement enforcement after a particular MI system has been placed on the market;
– Establishing a governance structure at European and national level.

The regulatory framework for AI systems employs a risk-based approach, defining four levels of risk.

A key finding is that "Any AI system that clearly threatens people's safety, livelihoods, and rights will be banned, from social scoring systems implemented by governments to games that use audio support to encourage dangerous behavior" [6].

[5] Wang, Q.–Sun, T.–Li, R. (2023): Does artificial intelligence (AI) reduce ecological footprint? The role of globalization. *Environmental Science and Pollution Research,* 30., pp. 123948–123965.

[6] Madiega, T. (2024): *Artificial intelligence act,* Available: https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698792/EPRS_BRI(2021)698792_EN.pdf

AI and Sustainability

Sustainable growth must be distinguished from sustainable development, because in the former we strive to be more, in the latter we are better [7].

The Sustainable Development Goals (SDGs) were unanimously adopted by the 193 member states of the United Nations in September 2015 for the period 2015–2030. However, we can interpret these development goals in a way that cannot be legally enforced, but only in the form of general political and policy-based commitments. The Sustainable Development Goals have 17 main goals and 169 related sub-goals. The main objectives are the following:

1. No poverty.
2. Zero hunger.
3. Good health and well-being.
4. Quality Education.
5. Gender equality.
6. Clean water and sanitation.
7. Affordable and clean energy.
8. Decent work and economic growth.
9. Industry, innovation and infrastructure.
10. Reduced inequalities.
11. Sustainable cities and economies.
12. Responsible consumption and production.
13. Climate action.
14. Life below water.
15. Life on land.
16. Peace, justice and strong institutions.
17. Partnership for the goals [8].

All of the 17 named goals are affected by AI. In the case of 7 goals, a commitment that is in line with the benefits offered by AI appears in relation to the sub-goals. These are: no poverty (Goal 1); quality education (Goal 4); affordable and clean energy (Goal 7); but mostly the industry, innovation and infrastructure (Goal 9); sustainable cities and economies (Goal 11), peace, justice and strong institutions (Goal 16); and partnership for the goals (Goal 17).

[7] Gyulai I. (2021): *Ökológiai Intézet a Fenntartható Fejlődésért.* www.ecolinst.hu

[8] UN (2015): *Sustainable Development Goals /SDGs/ of the 2030 Agenda for Sustainable Development.* https://www.un.org/sustainabledevelopment/sustainable-development-goals/

In the case of these sub-goals, the strong technological exposure predicts that they could be implemented much more efficiently with the involvement of AI applications [9].

The purpose of this study is not to present the application possibilities of AI in relation to all sustainability goals [10], but to serve the student attitudes that are the focus of our research we cite some examples from the literature.

The responsible use of AI (and the possibility of human control) is of key importance. Uncertainty is present in all AI applications, as a result of which an unfavourable AI development scenario can adversely affect the Development Goals. If the appropriate guarantees are not created by the states through legislation or if the interested actors do not act accordingly during the practical implementation, this can easily happen [9].

Nowadays, artificial intelligence is used to solve problems, especially to reduce the use of labour, to increase the efficient use of resources and to promote sustainable business processes [11].

The most common AI-supported topics in agriculture: Forecasting 40%, harvesting 31%, advanced plant care 29%, weed control 21%, supply chain 4%, management of used resources 3% and automated milking and animal husbandry 2% [12].

And by using different drones, it becomes possible to assess the exact location and extent of disaster-stricken areas – especially large-scale fires – and to plan protection measures in a more targeted manner [13].

Furthermore, a study draws attention to the possibility of predicting energy demand by using a kind of artificial neural network of the AI model through the prediction of Türkiye's energy production [14].

The above examples show the complexity of the topic. In the following chapters, we will cover the research conducted among our students.

[9] Kecskés G. (2023): A mesterséges intelligencia az ENSZ Fenntartható Fejlődési Céljai szolgálatában In: Glavanits J. (Ed.): *Fogyasztóbarát és fenntartható mesterséges intelligencia – a velünk élő AI egyes aktuális kérdései.* Győr: UNIVERSITAS-Győr, pp. 45–62.

[10] Falus, O. (2024): Thoughts on legal sustainabilty – 'Nihil sub sole novum.' *Russian Law Journal,* 12., (2.), pp. 51–59.

[11] Nagy S. (2023). Az agrobiznisz kihívásai a mesterséges intelligencia térnyerésének tükrében – szakirodalmi szintézis In: *Mezőgazdasági és vidékfejlesztési kutatások a jövő szolgálatában 4.* Szeged: MTA SZAB Mezőgazdasági Szakbizottság, pp. 159–175.

[12] Sachithra, V.–Subhashini, L. D. C. S. (2023): How artificial intelligence uses to achieve the agriculture sustainability: *Systematic review. Artificial Intelligence in Agriculture,* 8., pp. 46–59.

[13] Takáts A.–Bednárik É.–Németh N.–Koloszár, L. (2023): Drónos megfigyelések lehetőségei a katasztrófavédelem és tűzvédelem területén. In: Széles Zs.–Szőke T. M. (Eds.): *A mesterséges intelligencia szerepe a fenntartható gazdasági döntésekben.* Sopron: Sopron Egyetemi Kiadó, 72–92.

[14] Bayrak, M.–Esen, Ö. (2014): Forecasting Turkey's Energy Demand Using Artificial Neural Networks: Future Projection Based on an Energy Deficit". *Journal of Applied Economic Sciences,* 2., (28.), pp. 191–204.

The research

Research Method

In the course of our study, the involvement of the students of the University of Dunaújváros, Hungary, in relation to the spread of AI, their level of information on the topic, and their attitude towards the sustainability of AI came into focus.

To ensure the representativeness of the students, the digital survey was applied to several basic courses. Regarding the methods, we used an online survey with a questionnaire. With regard to the sampling procedure, we chose to fill in the students on a voluntary basis. We had a total of 559 respondents.

In order to research the social effects of AI, the composition of the questionnaire survey was as follows. The research is guided by 9 demographic questions, in which we also asked about the students' affinity for the topic. After that, in the case of statements related to the scope and social effects of artificial intelligence, as well as AI and sustainability, the respondents had to declare the importance of the answers based on a Likert scale from one to five. The last 2 questions were explanatory, in which the students could express themselves freely about the topic. Student values and attitudes related to the topic were brought to the surface in this way. During the research, we also used the diffusion model of innovation, so it is also necessary to discuss it.

Our preliminary assumption and hypothesis related to the study were as follows:

Hypothesis: Students are mostly informed about the effects of AI, but they are not supporters of the positive role of AI in sustainability.

Sampling

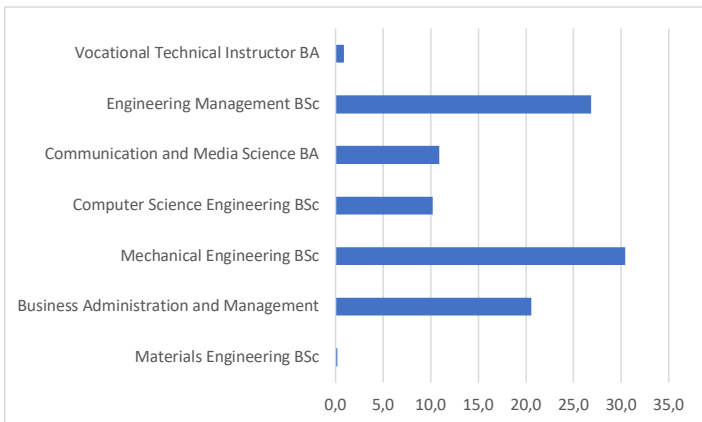
Within the demographic data of undergraduate students, the majority of respondents (68.8%) are men, 31.2% are women. Due to the characteristics of the basic population, we did not think that age differences were relevant, but they were an important attribute due to correspondence training. 23.4% of the students are under 25 years old, and another 35.6% are between 25–35 years old. Regarding the respondents, in the case of the division by department, 13.6% of the students participate in full-time and 86.4% in correspondence courses, which also presents the shift in the application rates of the last period.

We also asked what qualifications the students had already obtained and what work experience interval was available to them. 31.8% already have a higher education (of course, mainly in the case of correspondence courses), examining the internal distribution of this, 20% have specialized higher education courses. We also got a mixed picture in terms of work experience. Only 2% have not yet, and another 7% have less than one year of work experience.

In terms of students' residences, 23.8% live in rural areas, 61.8% live in cities, and 14.4% are students from the capital. In the case of the citizens of Budapest, we experienced marked differences in some of the results.

Regarding labour market status, 14.8% are students, 78.8% are employees, 3.9% are entrepreneurs, 1.1% of them are unemployed, and 1.4% of them are receiving childcare fee. The student status was certainly marked by those who could only interpret the answer in this legal relationship. With regard to the majors, it can be said that the distribution of those filling in is representative of our courses.

Figure 1. Distribution of respondents according to majors (%)



Source: Own edition, based on the research.

Presentation of the research results

Students' Perceptions of AI's Sustainability

In addition to the spread model, we present some answers by topic in the averages of the Likert scale. Regarding the role of AI in sustainability, we mapped student opinions based on sustainability topics. Responses are in *Table 1*.

Table 1. Students' attitudes

Question	Average (N=559)	Dispersion
AI will be able to support sustainability	3,6	1,0
AI can help end poverty	2,8	1,3
AI can help end hunger	2,7	1,3
AI can help boost health and well-being	3,2	1,2
AI can help deliver quality education	3,6	1,1
AI can help make gender equality mainstream	2,8	1,2
AI can help with clean water and basic public cleanliness	3,0	1,2
AI can help with affordable and clean energy	3,3	1,1
AI can help with fair work and economic growth	3,3	1,1
AI can help industry, innovation and infrastructure	3,7	1,0
AI can help reduce inequality	2,9	1,2
AI can help with sustainable cities and communities	3,3	1,0
AI can help in the area of responsible consumption and production	3,3	1,1
AI can help tackle climate change	3,2	1,2
AI can help protect oceans and seas	3,2	1,2
AI can help protect terrestrial ecosystems	3,2	1,2
AI can help with peace, justice and strong institutions	2,9	1,2
AI can help in the area of partnership and cooperation to achieve sustainability goals	3,2	1,1
AI can help the realization of partnership and cooperation in the field of Finance	3,3	1,1
AI can help the realization of partnership and cooperation in the field of Technology	3,6	1,0
AI can help the realization of partnership and cooperation in the field of Education and Training	3,6	1,1
AI can help the realization of partnership and cooperation in the field of trade	3,5	1,0
Other effects of AI should also be considered in Sustaina-bility, such as the energy hunger of new technology	3,7	1,1

Source: Own edition, based on the research.

In the table, marked deviations are indicated by filling. In the case of their answers to other questions, it can be stated that they have confidence in the application of the innovation in question, but they do not believe in its positive effect on GDP.

Students' Opinions Concerning Future

In relation to the students' vision of the future, a research showed the future ideas and expectations of student attitudes related to robots, artificial intelligence and their effects in employment [15]. In our current survey, as an open question regarding the level of trust, we asked in which areas the trust level of AI reached the level of human decisions.

We list some of the answers:

– "Political."
– "Financial investments, analyses."
– "Informatics."
– "Marketing."
– "Education."
– "I don't know exactly, but one thing is certain: people believe they want AI. If you want to believe AI, you will. The question is how well he does it."
– "Database Management."
– "Information flow."
– "Qualified, statistical data query."
– "Financial sector, Transportation and self-driving vehicles, Customer service and chatbots, Manufacturing and automation, Marketing and advertising optimization."
– "Customer service."
– "Also in their answer to our open question, they believe that it is worth considering the impact of AI in the case of sustainability issues in the following topics:
– "There are jobs that don't need to be done by humans, and therefore the retraining of these people should be supported."
– "Recycling."
– "Negative high energy demand, human supervision. Positive available information is a development opportunity."

[15] Kőkuti T. (2021): Hallgatói munka-érték-preferenciák a digitális oktatási formák bevezetésének fázisában. In: Balázs L. (Ed.): *Digitális kommunikáció és tudatosság.* Budapest: Hungarovox, pp. 65–77.

– "They're going to lean on him too much."
– "I wouldn't use it for military purposes because it could have a more serious negative effect."
– "Like all technological advances, this will cause a lot of people to become unemployed."
– "Fewer jobs."
– "Imature."
– "Energy use, Resource efficiency, Waste reduction, Biodiversity preservation."
– "Sustainable transport."
– "Negative High energy demand monitoring, Positive Technological development opportunity, abundance of information."
– "AI can contribute to sustainability by optimizing energy and resource use, but it can also have a negative impact through energy-intensive computing operations."
– "Unfortunately, there will be/are those who use it unethically, abuse the opportunities, even to gain an advantage in political or economic competition."
– "Increasing energy efficiency, Environmental monitoring, Optimizing transport systems."
– "Negative: AI models with high energy consumption, Data collection and data protection."
– "The control of the ideology framework that determines the development directions of AI."
– "It's a tool that, if used well, will have a positive effect, if used poorly, it will have a negative effect."
– "Still, a lot of people don't have jobs and robots with AI don't require wages. However, they are faster and probably heavier than humans. In addition, we can get very comfortable using AI in any field, I think this is something worth paying attention to."
– "Regarding sustainability and AI, e.g. during the recycling of electric car batteries, during the recycling of various plastics used in the automotive industry."
– "AI is not a panacea, many things could be achieved without it, if there was a demand for it, because AI suggests it will not be possible."
– "Green energies."
– "Huge energy demand, human influences/relationships are pushed into the background."
– "Forecasts, prognoses regarding the resources used."
– "I feel that the work of the poorer, less educated class is in danger, this is a negative effect."
– "People usually stick to the usual and don't want to open up to new things."
– "Human inflexibility, fear of innovations."
– "The lack of preparation for their application and the lack of building the tools and relationships necessary for their operation."
– "Safely establishing the relationship between AI and humans."
– "Trust, to understand its purpose, how it works and what its benefits are."

Conclusion

During the changes related to technical development, we explored the opinions and attitudes of university students regarding the spread of artificial intelligence. The reception of the introduction of the innovation was assessed. During the results, we managed to represent the categories of the spread model. Innovators, early adopters, and the early majority are all overrepresented compared to the traditional model. The late majority and laggards lag behind significantly. In the case of the latter, we can only speak of 1.8%.

Based on their answers to a direct question, our students clearly believe that AI will be able to support sustainability. However, the picture is more nuanced when sustainability is broken down into thematic areas. They see that it can help in the implementation of quality education, as well as in the field of industry, innovation and infrastructure. However, students are skeptical about its role in eradicating poverty and ending hunger, as well as mainstreaming gender equality. Our second assumption was thus only partially confirmed.

The examination of the topic of partnership and cooperation to achieve sustainability goals yielded interesting results. Overall, they only see its relevance in this with an average value of 3.2, however, if we look at the details, they assign a more prominent role to AI in the case of partnership cooperation in all fields of expertise. This is true in the fields of technology, education and trade, but less so in the case of financial cooperation.

Most notably, in addition to supporting sustainability solutions for industry, innovation and infrastructure, they agreed on the question that other effects of AI should also be taken into account in sustainability, such as the energy hunger of new technology.

Only negative differences were found for questions related to workplaces. Marked differences have been marked in the table. As a result of your query, artificial intelligence or robots are used in fewer places. They do not see the social and economic usefulness of technology as significant either. In the fields of industry, the service sector and the entertainment industry, they do not consider innovations that fit the topic to be as important as in the previous survey [16]. Their opinion about school work is very decisive, according to AI, the entire vertical of education will change.

[16] Kőkuti T.–Balázs L.–András I.–Rajcsányi-Molnár M. (2023): Collaborating with Artificial Intelligence – AI in Business Communication Education. In: Óbudai Egyetem (Szerk.): *IEEE 6th International Conference and Workshop in Óbuda on Electrical and Power Engineering (CANDO-EPE 2023): Proceedings.* Danvers: IEEE, pp. 287–294.

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AYNUR GULUYEVA *

The problem of water supply of population and farms in Aghdam and Fuzuli regions

Abstract: In modern times, the provision of water resources is one of the main factors affecting the sustainable settlement of the population and its employment. In the context of global warming and climate changes, efficient use of limited water resources is very important. Providing water to the population is considered one of the important factors of improving the quality of life. This issue is of special importance for the liberated territories of Azerbaijan. In the long-term perspective, the level of provision of water resources in rural areas plays an exceptional role in ensuring the sustainability of settlement. The article is dedicated to the possibilities of using water sources and improving drinking water supply in Agdam and Fuzuli administrative regions, which are included in the Karabakh economic-geographical region. The possibilities of providing water sources to the population, especially rural communities, were analyzed and economically-geographically evaluated. The article examines the role that access to existing water sources can play in the employment of the population in those administrative regions. For each of Agdam and Fuzuli regions, the possibilities and prospects of providing the population with water resources were investigated separately. Proposals and recommendations for improving water supply have been made.
Keywords: Sustainable, population, water supply, settlement, employment.

Összefoglalás: A modern időkben a vízkészlet biztosítása az egyik fő tényező, amely befolyásolja a lakosság fenntartható letelepedését és foglalkoztatását. A globális felmelegedéssel és az éghajlatváltozással összefüggésben nagyon fontos a korlátozott vízkészletek hatékony felhasználása. A lakosság vízellátását az életminőség javításának egyik fontos tényezőjének tekintik. Ez a kérdés különösen fontos Azerbajdzsán felszabadított területei számára. Hosszú távon a vidéki térségek vízkészlet-ellátottsága ki-

* *Ministry of Science and Education of the Republic of Azerbaijan Institute of Geography named after Academician H. Aliyev*

Email: guluyevaaynur93@gmail.com

emelkedő szerepet játszik a település fenntarthatóságának biztosításában. A jelen tanulmány a vízforrások felhasználásának és az ivóvízellátás javításának lehetőségeivel foglalkozik a karabahi gazdaságföldrajzi régióhoz tartozó Agdam és Fuzuli közigazgatási régiókban. Elemezték és gazdaságföldrajzilag értékelték a lakosság, különösen a vidéki közösségek vízellátásának lehetőségeit. A kutatás annak vizsgálatára irányul, hogy a meglévő vízforrásokhoz való hozzáférés milyen szerepet játszhat az adott közigazgatási régiók lakosságának foglalkoztatásában. Agdam és Fuzuli régiók mindegyikében külön-külön felmérték a lakosság vízkészlettel való ellátásának lehetőségeit és kilátásait. Ennek eredményeként javaslatok és ajánlások születtek a vízellátás javítására.

Kulcsszavak: Fenntarthatóság, népesség, vízellátás, település, foglalkoztatás.

Introduction

After the liberation of the Karabakh and East Zangezur territories of Azerbaijan, which had been under occupation for nearly 30 years, in 2020, there was a need to restore the infrastructure that had been destroyed and devastated. One of the areas that suffered damage and needed restoration and efficient development is water resources management. During the occupation, river beds were neglected, polluted, and reservoirs and artificial reservoirs were seriously damaged. Ensuring the provision of water resources and accessibility to water sources is an important issue in terms of the population returning to their homelands and living prosperously, and the settlement of the population in the territories liberated from occupation. In order to consistently and sustainably solve the problem of water resource use, "Azerbaijan 2030: National Priorities for Socio-Economic Development" was approved. Based on these priorities, the "Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022–2026" was developed. The importance of ensuring the implementation of the National Priority "Great Return to the Liberated Territories" is reflected in the "State Program on the Great Return to the Liberated Territories of the Republic of Azerbaijan". One of the items mentioned in the program is the implementation of measures related to the construction, reconstruction, restoration of water management facilities, drinking water and irrigation water supply, as well as rainwater management in order to effectively use the water resources of the liberated territories [1].

[1] *I State Program on the Great Return to the liberated territories of the Republic of Azerbaijan*. Baku, 2022.

Azerbaijan is less well-supplied with water resources compared to other South Caucasus countries. In 2010–2023, the volume of water withdrawn from natural sources increased by 10.7 percent, and water consumption by 26.7 percent [2].

Taking into account the current situation and future risks, an order was signed on October 10, 2024 to approve the "National Strategy for the Effective Use of Water Resources".

[2] *Decree of the President of the Republic of Azerbaijan on the allocation of the "National Strategy for the Use of Water Resources".* Baku.

The purpose of the study

To analyze and assess the accessibility of the population to existing water sources in the territory of the Aghdam and Fuzuli regions, which are part of the Karabakh economic region, and to investigate the possibilities of improving water supply. The article also examines the role that accessibility to existing water sources in the Aghdam and Fuzuli regions can play in the employment of the population. For this purpose, the tasks set were to analyze the existing water sources in these regions from an economic and geographical perspective, identify the villages through which the main rivers that play an important role in water supply pass, as well as analyze multi-year statistical indicators on water use.

Methodology

During the study, data expressing quantitative indicators of the population were compared based on population census data of the last two years (2009 and 2019). The data obtained through the Google Earth program made it possible to monitor and analyze the geographical location of settlements in the study area and their proximity to water bodies. The research also used the indicators of the State Statistical Committee of the Republic of Azerbaijan on water resources and related scientific literature. Based on the comparative analyses conducted, certain conclusions were drawn and relevant recommendations were made.

Analysis and discussion

The administrative regions of Aghdam and Fuzuli are located in the eastern part of the Karabakh economic region, and both are distinguished by the vastness of their plains and high demographic potential. The territory of these administrative regions, dominated by a plain relief and semi-desert landscape, is characterized by low rainfall (400–500 mm per year) and a relatively low density of the river network. The territory of both regions is characterized by fertile soils that allow the development of irrigated crop production. Aghdam and Fuzuli regions together have 205 settlements [3], which is 34.2% of all settlements in the region.

Part of the Aghdam region was occupied from the early 1990s to 2020. The Gargarchay and Khachinchay rivers and the reservoirs of the same name located on the Khachinchay are of great importance in the water supply of the Aghdam region, which has an area of 1,150 km^2. Approximately 92% of the administrative region's lands are suitable for cultivation [4]. During the occupation of Aghdam, water sources in its territory were deliberately blocked during the summer months, which seriously damaged the economy. During the rainy season, the removal of these barriers led to floods. There are fertile conditions for the development of grain growing and other agricultural sectors.

The Aghdam administrative region ranks first in terms of population in the Karabakh economic region. Its population is 178.4 thousand people [5], which is 1.8% of the country's population and 24.2% of the economic region's population.

Rapid reconstruction and reconstruction work is being carried out in the Aghdam region, especially in the villages of Kangarli, Khi-dirli, Sarijali and Bash Garvand [6]. The first migration to the city of Aghdam is planned for 2025. During the resettlement of the population, the issue of water supply is of great importance in terms of ensuring employment, household use and cultural recreation. The presence of agricultural lands (29%) [7] in the district and the fact that agriculture is the traditional occupation of the population are factors that necessitate the efficient use of water resources. The main statistical indicators related to water use in the administrative district are given in *Table 1.*

[3] Census of the district of the Republic of Azerbaijan (2019): *ARDSK. Statistical collection, I c. Population size, sex-age repeat.* Baku.

[4] Mammadov, C. H. (2024): Hydrological characteristics of rivers of Aghdam region, Water problems: Science and technology. *International Peer-Reviewed Scientific Journal,* 1., (23.).

[5] Among Azerbaijan (2023): *Statistical bulletin.* Baku.

[6] https://president.az/az/articles/view/66857

[7] Geography of Karabakh and Eastern Zangezur (2021): *Natural-geographic conditions and socio-economic development potential.* Baku.

Table 1. Some indicators of water use in Aghdam region

Actions	2015	2018	2019	2020	2021	2022
Water consumption, mln. cubic m.	241.7	267.7	299.9	261.3	274.9	289.9
Use of water for domestic drinking purposes, mln. cubic m.	5.4	1.9	1.5	1.3	1,2	1,2
Water supply for irrigation and agriculture, mln. cubic m.	236.3	265.8	298.4	260.0	273.6	288.8
Disposal of waste water, mln. cubic m.	5,6	1.7	0.03	0.0	0.0	0.04
Water loss, mln. cubic m.	36.2	61.8	59.5	85.1	68.9	79.2

Source: Regions of Azerbaijan, ARDSK, 2023, p. 864.

As can be seen from *Table 1*, although water consumption in the region has increased, water use for domestic and drinking purposes has decreased. The main reason for this is that water is mainly used for irrigation in agriculture. In 2022, water consumption in the Aghdam region accounted for 15.8% of the total consumption in the Karabakh economic region (1828.0 million m3) [8]. Water used for irrigation and agricultural water supply is 15.8% of the total indicator in the economic region (1820.4 million m^3) [8].

Water loss indicators reached their maximum in 2020. Although water consumption in 2020, as well as irrigation and agricultural water supply indicators, decreased compared to 2019, water loss reached its highest level in that year. Water loss in Aghdam district in 2022 accounts for 14.6% of the total water loss in the economic region in 2022 (541.9 million m3). The main reason for water loss is non-compliance with norms and rules during irrigation, non-application of "smart irrigation systems", and lack of concrete lining of ditches and canals. Since 2021, an increase in water consumption and water supply to agriculture has been observed. When analyzing the table, it is also noticeable that the wastewater discharge indicator decreased in 2015–2022, and slightly increased in 2022.

[8] Environment in Azerbaijan (2024): *Statistical compilaion.* Baku: DSK.

The Khachinchay River, which plays an important role in the water supply of the Aghdam region, flows through the villages of Aliagali, Alimadetli, Khachindarbetli, Mollalar, Magsudlu, Talishlar, Kosalar, Abdynli, Goytepe, Shirvanli, Shukuragali, Sarijali, Uchoglan, and Orta Qishlag of the region and is an indispensable source of drinking water for the population. Since these areas have favorable conditions for the development of agriculture, it is possible to ensure the employment of the residents of the mentioned villages, who will be resettled in the coming years, in income-generating agricultural fields to a large extent through the efficient use of the water of this river.

The Khachinchay reservoir, located 6 km east of the Aliagali village of the Aghdam region, in the Khachindarbetli village, has not been used for a long time due to its occupation. The reservoir has the potential to meet the water needs of the population of the villages of Khachindarbetli, Aliagali and Mollalar in particular. The Khachinchay reservoir allowed for the irrigation of more than 10 thousand hectares of land before the occupation.

According to expert estimates, the Khachinchay reservoir can irrigate an area of 20,000 ha or 200 km^2 [9]. The effectiveness of measures to be taken to improve the well-being of rural communities in the mentioned settlements can be largely determined by improving water supply. The Gargarchay River, formed by the confluence of the Khalfali River and the Zarisli River, flows through the territory of Aghdam district and at a shorter distance to Khachincha. This river passes through or near the villages of Poladli, Garadagli, Shikhbabali, Saybali, Ajarli, Novruzlu and Yusifjanli. It should be noted that the main purpose of the construction of the Agdamkend water reservoir, which was built in Gargarchay in 1963, was the irrigation of agricultural lands.

Aghdam's water supply uses water from the kahriz, canal and subartesian wells. A. According to Guliyev, there were 105 kahriz in the territory of Agdam region in 1938 [10]. 202 researchers are deployed in 48 unoccupied areas of the region [11].

It seems that water resources will be widely used not only in agriculture and household resources, but also in industry, with the possibility of the industrial park in Aghdam, and the use of water resources and reserve resources in the region. A factory for the production of electrical distribution equipment, electrical sockets and concrete substations in Aghdam Industrial Park; ventilation, fire-fighting equipment and metal products production plant, wall paper production plant and started operating. For now, the food industry is being developed in the region.

[9] Mammadov, C. H. (2024): Hydrological characteristics of rivers of Aghdam region, Water problems: Science and technology. *International Peer-Reviewed Scientific Journal,* 1., (23.).

[10] Guliyev A. G. (2019): *Kahrizlari of Azerbaijan.* Baku.

[11] http://azkahriz.az

There is a large demand for industrial products in the country, but the growth of local production is possible. In Aghdam, there was a bakery, a canning factory, an initial winery and a number of industrial enterprises in the vineyard state farm named after "Ali Bayramov" [12]. It is possible to obtain the main sources of water for the location and operation of all these and other industrial enterprises.

It was kept in the area near the 30th part of Fuzuli district, which is another research area. The district is located on the left bank of the Araz river. The territory of Fuzuli region with an area of 1386 km 2 is mainly lowland and plain. Its population is 130,000 people [13], making up 1.3% of the country and 17.6% of the economic region. 822 families or 3132 people have been settled in the city of Fuzuli since the end of the war until now, i.e. until the third quarter of 2024. The important role of the flowing Kondalanchay, Guruchay, Gozluchay and other small rivers, the reservoirs of the same name built in Kondalanchay, and the Araz river and the Mil-Mugan hydrojunction play an important role in providing water to the region. Some indicators of water use in Fuzuli region are given in *Table 2.*

Table 2. Some indicators of water use in Fuzuli district

Actions	2015	2018	2019	2020	2021	2022
Water consumption, mln. cubic m.	156.9	164.4	159.2	163.8	148.9	160.6
Use of water for domestic drinking purposes, mln. cubic m.	6.0	1.3	1,2	1,2	1,2	1.3
Water supply for irrigation and agriculture, mln. cubic m.	150.8	163.1	158.0	162.6	147.7	159.3
Disposal of waste water, mln. cubic m.	0.2	0.0	0.0	0.0	0.1	0.1
Water loss, mln. cubic m.	197.6	169.9	168.5	137.4	124.8	144.4

Source: Regions of Azerbaijan, ARDSK, 2023, p. 864.

[12] Geography of Karabakh and Eastern Zangezur (2021): *Natural-geographic conditions and socio-economic development potential.* Baku.

[13] Among Azerbaijan (2023): *Statistical bulletin.* Baku.

As can be seen from *Table 2*, water consumption by the population reached 164.4 million m^3 in 2018, which was the highest indicator. This indicator accounts for 10.3% of the water consumption in the Karabakh economic region (1595.5 million m^3) [14] in that year. It is also noteworthy that water supply for irrigation and agriculture reached its highest level in the same year *(Table 2)*. This indicator accounts for 10.3% of the indicators for irrigation and agriculture water supply in the Karabakh economic region (1586.4 million m^3) [14]. The low use of water for domestic and drinking purposes in that year is due to the greater use of water for agricultural purposes. The increase in water consumption indicators in 2022 is due to the start of migration to the Fuzuli region, the return of the population and its settlement.

It flows through the villages of Upper Yaglivand, Devletyarli, Mirzajamalli, Seyidmahmudlu, Merdinli, Karakhanbeyli, Alkhanli, Upper Kurdmahmudli, Ashaghi Kurdmahmudlu, Ahmadbeyli, near Bala Bahmanli village of Araz, which is 102 km long. Playing an important role in the economy of the villages through which the river passes, there is a need for great assistance in settling and engaging the population in profitable economic activities.

More energy consumption of irrigation activities was built after the Yagli, Yarli and Mirzajamalli villages of Kondalanchay and the reservoirs of Kondalanchay-1 (1962), Kondalanchay-2 (1964) and Ashaghi Kondalanchay (1981). These three reservoirs built in Kondalanchay serve to irrigate 6.7 thousand ha of cropland [15]. There is a settlement of the Mil-Mugan water junction built near Horadiz settlement of Fuzuli district in the region's water supply. In Fuzuli, Beylagan, Aghjabedi and Khojavend regions, the water of this hydrojunction is used for irrigation of crops, and these possibilities are at a high level. In the process of putting this hydrojunction into operation, two areas of 200,000 ha in each of the Islamic Republics of Azerbaijan and Iran were provided with irrigation water. Two areas of Fuzuli, Beylagan, Aghjabedi, Imishli and Aghdam regions are supplied with irrigation water through the Bash Mil, Yukhari Mil and Yeni Khangizi canals starting from the hydrojunction. Hasanliarkh and Maralarkh rivers, which take their source from Araz river, cause irrigation disease in Fuzuli and Jabrayil regions. The use of groundwater and subartesian wells also plays an important role in water supply in the region. According to A. Guliyev, there were 71 kahriz in Fuzuli district in 1938 [16].

[14] Environment in Azerbaijan (2024): *Statistical compilation.* Baku: DSK.

[15] Geography of Karabakh and Eastern Zangezur (2021): *Natural-geographic conditions and socio-economic development potential.* Baku.

[16] Guliyev A. G. (2019): *Kahrizlari of Azerbaijan.* Baku.

[17] http://azkahriz.az

In 2021, for research in the residential areas of the district, the Guruchay estuary in the Shukurbeyli settlement and the Ahmadalilary estuary in the Ahmadalilary settlement were investigated [17].

[17] http://azkahriz.az

Conclusion and suggestions

- After 2020, water consumption and agricultural energy in both regions will work with the energy of the water used. The reason for this is the increase in the opportunities to engage in farming and animal husbandry under the same conditions in Agdam and Fuzuli regions, and at the same time, migration to Fuzuli region has begun.
- It is important to ensure the return of the population to the territories freed from occupation, first of all, to establish workplaces and improve housing and communal conditions, build the necessary infrastructure, and ensure the use of additional water at the appropriate level. We believe that in Agdam and Fuzuli regions, the population is engaged in some areas of agriculture, the improvement of water works in these areas, the restoration of destroyed reservoirs, canals and other hydrological objects.
- It is necessary to constantly focus on the possibility of actions related to food security due to warming, drought and limitation of water resources. It is necessary to take into account the dangers mentioned in the Aghdam Fuzuli valleys.
- It is possible to engage in agriculture based on the population in the research regions. Irrigation devices should be based on the latest technology to prevent water wastage.
- In the research areas, the use of water purification devices is mandatory for providing the population with household solutions and clean water. At the same time, special attention should be paid to concrete lining of ditches and channels.
- Implementation of education, implementation of water use stimulation mechanisms, correct application of water use fees in practice and other measures can be useful for the formation of social responsibility of people.

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AZAR HUSEYNLI *

How does technological advancements affect unemployment?

Abstract: The interdependence between unemployment level and technological advancements is a long-disputed issue. Logically technological advancements increase unemployment and lead to the social problems in many occasions. The paper examines the issue and tries to come up with the mechanisms of the relationship. This relationship was and will be a driving force for many changes in the society and economy. There are long-term and short-term affects of technological advancements to the unemployment.
Keywords: Technological change, long-term and short-term effects, skilled employees, employment trends, interdependence.

Összefoglalás: A munkanélküliségi szint és a technológiai fejlődés közötti összefüggés régóta vitatott kérdés. A technológiai fejlődés a legtöbb esetben logikusan növeli a munkanélküliséget és társadalmi problémákhoz vezet. A tanulmány ezt a problémát járja körül, és megpróbálja felderíteni a kapcsolat mechanizmusait. Ez a kapcsolat mindig is a társadalom és a gazdaság számos változásának hajtóereje volt. A technológiai fejlődés rövid- és hosszú távon egyaránt hatást gyakorol a munkanélküliségre.
Kulcsszavak: Technológiai változás, hosszú és rövid távú hatások, szakképzett alkalmazottak, foglalkoztatási trendek, egymásrautaltság.

Introduction

There is a big literature that talks about technology and unemployment. [1, 2, 3, 4] studies are about unemployment and technologic advancements, but the literature lacks the mechanism of this interdependence. The paper seeks to establish the relation between technological advancements and unemployment.

* *PhD student and Lead Researcher at Economic Scientific Research Institute under the Ministry of Economy of the Azerbaijan Republic*
Email: azer.huseynli@esri.gov.az

[1]Zhou, Yuanren–Chen, Menggen–Gao: *Lingxi, Digital Literacy, Economic Participation, and Household-Specific Income Inequality: Evidence from China.* Available at SSRN: https://ssrn.com/abstract=4834790 or http://dx.doi.org/10.2139/ssrn.4834790

[2] Goldfarb, A.–Tucker, C. (2019): Digital Economics. *Journal of Economic Literature,* 57., (1.), pp. 3–43. https://www.jstor.org/stable/26673202

[3] Klimczuk, A.–Klimczuk-Kochańska, M. (2015): Technological Unemployment. In: M. Odekon (Ed.): *The SAGE Encyclopedia of World Poverty* (2nd Edition), pp. 1510–1511. Thousand Oaks, CA: SAGE Publications. https://doi.org/10.4135/9781483345727.n783

[4] Kővári, E.–Saleh, M. A.–Hajmásy, G. (2022). The impact of corporate digital responsibility (CDR) on internal stakeholders' satisfaction in Hungarian upscale hotels. *New governance and management in touristic destinations. IGI Global.* https://doi.org/10.4018/978-1-6684-3889-3.ch003

The phenomenon of technologic change both straightforward and interesting topic. Modern economies are facing this every now and then. Even individually every person faces changing ways of buying and selling and doing business every day.

Knowledge economy has made people open to the changes everyone faces and needs to adapt to smoothly work and live in the modern society. All of us need to be able to adapt to the everchanging advancements that are happening in our businesses and households that we work live and inhabit. The technology is going to drastically change all the spheres that we have in our economies.

One of the most important result of technological advancement that we all face is unemployment and this has long-lasting implications for both individually and for the knowledge society as a whole. There are both short-term and long-term implications of technological advancements that we face.

The other issue is to make an individual and societies resilient to the technological changes that we continuously face. There are implications for the education and training systems that previously were designed to produce individuals for the steady work at the factories of the past. Factories of the future will be very different than what we do imagine. There will be new names and ways of working at the factories of the future. The knowledge that is essential for the people to work are not yet produced. We as a society have difficult problem to make the education and training system for the future that will equip our coming generations with necessary knowledge and skills to operate at the world of tomorrow.

The paper is made up of three sections. They are Analysis, and Conclusion sections. At the analysis section the author reveals the methodology of the paper and reveals what is reached after the analyzing the problem. Conclusion section lays out the ideas reached from the analysis.

Analysis

We have analyzed literature and tried to answer how does technologic advancements lead to unemployment. We have used deductive and inductive analysis to find out what is the real interrelation between unemployment and technologic advancements.

There are many aspects of the problem. The author is concerned with the inter-relation between technological advancements and unemployment. The author tries to uncover the relation that is not clearly addressed in the literature.

There are many steps before technology advancements lead to unemployment. There is a need to consider the level of average technological fluency and average literacy of the society. These issues do make big changes between societies. The other aspect of this equation is the level of learning new skills to work using new technologies.

Having mentioned these, let's go over the process of diffusion of technology advancements into the society. Firstly, there is a need to mention that the technological advancement level of the humankind not always lets engineers make new machines to change the methods of production directly and in no time. The other aspect is the availability of knowledge and methods to make desired machines. Provided that there are both knowledge and methods for the creation of needed machines engineers start their journey of making that machine.

After having the necessary means to be able to make machines the engineers are ready to start making desired machines. We need to direct the kind of machines that will not be dominant and will not have the power and possibility to hinder the peoples way to do this or other economic activity freely and counsciously.

When there is a new technologic advancement, it leads to the invention of some machine/program (hereafter machine). The machine is new and not many people are aware of this. The entrepreneur is eager to apply it into the production. The machine can be operated by several people. [3]

Shows that there are several mechanisms that start with technologic advancements and leads to the employment. [3] states labor saving organizational solutions as one of the elements of technological unemployment. Technological unemployment is the determinant of structural unemployment that is persistent in short-term during advancements in the economy. Of course, there are several layers of unemployment and all are either result or the determinant of technological unemployment. The economies face not only technological advancements in this regard.

After installing the machine into the production many people become unemployed. So, initially machine causes unemployment. As time passes, more people get acquainted by the technology. Some of these people hopefully start to train others. Some parts of the machine need people operators. People learn to operate several parts of the machine eventually. Eventually, the machine leads to the decrease of the unemployment.

[3] Klimczuk, A.–Klimczuk-Kochańska, M. (2015): Technological Unemployment. In: M. Odekon (Ed.): *The SAGE Encyclopedia of World Poverty* (2nd Edition), pp. 1510–1511. Thousand Oaks, CA: SAGE Publications. https://doi.org/10.4135/9781483345727.n783

Conclusion and Recommendations

Technology and unemployment relation mechanism is as following. The technology advancements lead to the creation of a new machine. Machine can be handled by few people. So many people become unemployed. As the machine is widely used in the industry, more people either learn and train other people to work with the machine. So, the unemployment decreases in the end.

There are different implications of the technological advancements. These implications can be grouped to two divisions. One for the individuals and other for the societies.

Let's start with group implications. Societies need to come up with resilient systems to make humanity easy to grasp the wealth of knowledge that we face.

It is not even enough to make perfect system that can be spread over the world. We need to consider to disseminate and diffuse the knowledge free and without barriers to each and everyone in the world. Technologies and machines have perfect ways to couple and come together. We need to find ways to learn and teach necessary skills and abilities for everyone of us to endure in the tornado of changes around us.

Let's pass to the individual implications that we can secure. We need to have individual plans for babies after they are able to learn anything. Individual characteristics should be "baked" at families. The author proposes individual plans for the children in families. So far families have been under shadow and we as a society did not start any important plans within families. It is high time for humanity to start teaching our children in families.

We as a society did not have any system for the determination of child's ability. Every training and ability should start with the capabilities and desires of the person that is ought to receive the education and training. Our education system needs to teach parents to grasp the capabilities of the children. We need to consider to bring together the system for this. The author proposes to name this system child ability determination system. Families so far has been free to work in this system. But now we do not have a single child to spare his or her abilities to become redundant. Our humankind needs to upskill every possible individual to help them become resilient for the future economies.

The other important factor is to make lifelong learning systems that every person in the world can freely and effortlessly reach and get use of it. Even if one individual country can make this system, it is not enough. This system needs to spread all over the globe and be open and handy to operate.

In the case we do not come up with necessary and compact systems individuals will be open to robot slavery. We need to consider this problem very seriously.

To sum up, unless we as a society have necessary learning and training systems in place for the knowledge economy it will be impossible for individuals to work, live freely in the future economies. Humankind can face robot domination even slavery. So, there is a need to be prepared to "live" with robot and technology domination and make individuals resilient to the demands of knowledge economy.

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CATHERINE ENOREDIA ODORIGE*

Development communication: an alternative growth and development measurement tool

Abstract: Sustainable development discourse arose to point us to the indiscrete use of earth's resources. Focusing on stemming the tide away from so-called developments that are short-term and reactive without recourse to the long-run implications of them. The use of GDP as the universal standard for assessing the overall progress of a nation, when it does not measure the welfare and social well-being of a nation's population is indicative of the era when sustainable development had not yet entered the development dictum. Scholars insist that Gross domestic product was not originally designed to measure overall national progress and well-being but only economic activities. Hence this has given birth to the Beyond GDP scholars crossing disciplinary boundaries who insist that the time for a substitute measurement tool is now. Development communication came to be due to a reverse turn in development initiatives by Official development actors ODA which was without consideration to involve those who would be the beneficiaries of those projects and as such most of the projects were a failure. Now development communication would point us tot he right approach to development. This study focuses on taking the lessons provided by the turn by development actors to engage in participatory communication for development as evidence to propose a new direction for measuring national progress as against the overall GDP instrument. An interdisciplinary approach to more accurate measurement tools, to which the development communication discipline makes an ample contribution.

Keywords: GDP, Sustainability, C4D, ODA, Development, Wellbeing, Measurements.

Összefoglalás: A fenntartható fejlődésről szóló diskurzus azért született, hogy felhívja a figyelmet a Föld erőforrásainak gátlástalan kizsákmányolására. Arra összpontosítva, hogy megfékezzük az olyan úgynevezett fejlesztéseket,

* *University of Dunaújváros, Institute of Social Sciences, Department of Organizational Development and Communication Sciences; Karabakh University; Women Researchers Council;*
E-mail: odorige@uniduna.hu

[1] Schmelzer, M. (2016): The Hegemony of Growth. In: *The Hegemony of Growth: The OECD and the Making of the Economic Growth Paradigm*. Cambridge: Cambridge University Press.

amelyek rövid távúak és reaktívak, anélkül azonban, hogy azok hosszú távú következményeit figyelembe vennénk. A GDP használata egy nemzet általános fejlődésének értékelésére szolgáló univerzális mérceként, amikor az nem a nemzet lakosságának jólétét és szociális jólétét méri, akkor azt a korszakot jelzi, amikor a fenntartható fejlődés még nem került be a fejlesztési diktátumba. A tudósok ragaszkodnak ahhoz, hogy a bruttó hazai termék eredetileg nem az általános nemzeti fejlődés és jólét, hanem csak a gazdasági tevékenységek mérésére szolgált. Ezért léptek színre a Beyond GDP (GDP-n túli GDP) tudományági határokat átlépő tudósok, akik ragaszkodnak ahhoz, hogy most van itt az ideje egy helyettesítő mérőeszköz bevezetésének. A fejlesztési kommunikáció fogalma a hivatalos fejlesztési szereplők (ODA) fejlesztési kezdeményezéseiben bekövetkezett fordulat következtében jött létre, amely nem vette figyelembe, hogy bevonja azokat, akik a projektek kedvezményezettjei lesznek, és így a legtöbb projekt kudarcot vallott. A fejlesztési kommunikáció most a fejlesztés helyes megközelítését mutatná meg nekünk. A jelen tanulmány arra összpontosít, hogy a fejlesztési szereplők részvételi kommunikációra való áttérésének tanulságait felhasználva új irányt javasoljon a nemzetek fejlődésének mérésére az általános GDP-eszközzel szemben. Ez a pontosabb mérőeszközök interdiszciplináris megközelítése, amelyhez a fejlesztési kommunikáció tudományága bőségesen járul hozzá.
Kulcsszavak: GDP, fenntarthatóság, C4D, ODA, fejlesztés, jólét, mérések.

Introduction

Gross Domestic product as the paradigm for measuring modern growth dates back to the intensive capitalist industrialization of the 18th century developing in three stages [1] followed by the political reaction to the great depression in the 1920/30s and third the post-Second World War reconstruction. It was adopted as the primary measurement of countries' economies at the Bretton Woods conference in 1944 when the International Monetary Fund and the International Bank for Reconstruction and Development were created.[1]

1 https://www.worldbank.org/en/archive/history/exhibits/Bretton-Woods-and-the-Birth-of-the-World-Bank (Accessed October 21 2024)

The challenges associated with it go back to the period of its adoption, Kuznets its architect gave a warning note that it is inadequate in gauging the welfare of a nation, and Policymakers seemed to be hasty for an easy way to justify their policies and would rather decide on what is easy than what is right became hooked on using GDP as the measurement for everything even though it was only supposed to measure economic activities like market production with monetary valuation of things which are priced and marketed [2, 3, 4]. It hinges on a faulty foundation of competitive rivalry between the communists and capitalists during the Cold War period; Khrushchev Nikita the Soviet communist leader proclaimed in 1958 that "Growth of industrial and agricultural production is the battering ram with which we shall smash the capitalist system" [1]. However, in 1968; 24 years after the adoption of GDP by the International Monetary Fund, J. F. Kennedy during his campaign at the University of Kansas strongly criticized GDP emphasizing that it measures everything except that which makes life worthwhile. The worthwhile things are such as having no prices like government-sponsored free health insurance, social harmony, community capital, natural resources, household child-care housewife services, and more.

The duo emphasized that with such huge limitations identified, we had carried on applying GDP as the gospel indicator for measuring a nation's success. Remaining the most globally accepted statistical indicator for measuring economic activities.

Other services not measured are related to volunteering for charities, a huge part of civil society success; company's CSR activities that could drive community and societal stability, and illegitimate transactions where industries like drugs and trafficking are undeniably huge income earners for perpetrators. Doing the easy but not the right thing informed the generalized use of GDP for measuring everything. Stiglitz et al. [5] make a case for GDP as not being wrong in itself, however, application has been the bane of it; incorrect use. The criticisms that have trailed this wrong use go back to the vocalizations that Kenedy began to pay to it, another is the reference to the turn made by the 4th king of Bhutan; Jigme Singye Wangchuk who declared at the UN assembly that he is adopting GNP-Gross National Happiness for measuring his country progress 1972, which validates Kennedy's

[1] Schmelzer, M. (2016): The Hegemony of Growth. In: *The Hegemony of Growth: The OECD and the Making of the Economic Growth Paradigm.* Cambridge: Cambridge University Press.

[2] Banerjee, A. V.–Duflo, E. (2019): *Good economics for hard times.* Juggernaut Books.

[3] Kapoor, A.–Debroy, B. (2019). GDP is not a measure of human well-being. *Harvard Business Review,* https://hbr.org/2019/10/gdp-is-not-a-measure-of-human-wellbeing

[4] Kubiszewski, I.–Costanza, R.–Franco, C.–Lawn, P.–Talberth, J.–Jackson, T. –Aylmer, C. (2013): Beyond GDP: Measuring and achieving global genuine progress. *Ecological Economics,* 93., pp. 57–68. https://doi.org/10.1016/j.ecolecon.2013.04.019

[5] Stiglitz, J. E.–Sen, A.–Fitoussi, J. (2010): *Mismeasuring our lives, why GDP does not add up.* Book well Publications.

reference to the things that are worthwhile not represented in GDP. Why appropriate everything that matters most with a fraction of it?

These examples mark the beginning of the Beyond GDP turn which has brought about the introduction of other measuring tools like (Beyond GDP Metrics, Green growth/GDP, measurement convergence, impart assessment tools, SEEA, System of Environmental Economics Accounting, SGNA System of Global and National Accounts-comprising environment society economy and distribution, Human Development HD) indicative of the existence of other progress Indicators, but they face severe challenges in overcoming the intellectual and institutional lock-in of GDP and a lack of methodological consensus. [6, 1].

Just like the reverse trajectory that gave birth to sustainable development which has garnered global partnerships where the affluent adopt lifestyles within the planet's ecological means (Brundtland 1987) as a result of evidence that created this need, Communication for Development or Development Communication paradigm to check Official Development Agencies development interventions in developing countries which where largely unsuccessful due to the lack of stakeholder engagements. C4D became the participatory initiative to ensure project success.

Apart from ODA, governments especially in developing countries were/are guilty of this method of development as well which adopted a diffusion hypodermic needle system of information spread that assumed that populations would adapt information shared through the mass communication channels, this was only assumptive as the results will later show. The success of participatory communication in motivating development is why communication for development qualifies to join the growth measurement hopefuls to substitute for GDP. Stakeholder engagement is the strength of development communication and qualifies it for a place as an instrument for national progress measurement. However conceptual challenges yet beguile communication for development paradigm as expressed both in theorization by scholars and implementation by development actors. Achieving a sustainable future is dependent on getting the right measurement tool, and since development communication is an undeniable development measure, it deserves systemic attention and adaptation.

[1] Schmelzer, M. (2016): The Hegemony of Growth. In: *The Hegemony of Growth: The OECD and the Making of the Economic Growth Paradigm.* Cambridge: Cambridge University Press.

[6] Kaufmann, R.–Barth, J.–Steffens, L.–Le Lannou, L-A.–Gerer, A.–Kiecker, S. (2023): *Mainstreaming wellbeing and sustainability in policymaking: technical and governance levers out of the institutional GDP lock-in.* Cologne: ZOE Institute for Future-fit Economies.

Methodology

The research adopts a systematic literature review (SLR), designed to synthesize meaningful knowledge from a cross-section of studies, suitable also for studies that are interdisciplinary like the topic in question. Following a systematic transparent, and reproducible process for identifying academic literature about a clearly defined topic or research question [7, 8]. In their paper Fisch and Block recommend following the six-step process which includes the motivation of the topic by stating the research question, systematically identifying relevant literature, choosing a balance between length and breadth, focusing on related concepts, and deriving a meaningful conclusion following a coherent structure. The search triangulated across titles with GDP, well-being and development communication, and sustainable development.

Two questions are identified in this research the first is; (1) Why have we continued to use GDP as the global measurement tool? Measurements are supposed to help us set performance indicators, which should help to identify progress. Going by several calls for more salient ways of measuring national growth, the present common GDP for measuring growth has long moved into the rhetoric zone. It has outlived its purpose which was in the words of Khrushchev for communists to smash capitalism and vice versa. Following the above the study identifies ease and the challenge of lock-in as the reason for the reluctance to adopt other measurement tools that have been identified and proposed by other disciplines.

Can development for communication discipline have its own measurement paradigm that can be adopted as a global measurement indicator?

The Search for Alternative Measurements

The session examines scholarly proposals and alternatives for the measurement of national progress. Immanuel Kant's insistence that there is no such thing as a good theory that doesn't work in practice (cited in [9]) is a compass to access the practicability of countries' GDP display in comparison to their well-being and poverty levels.

[7] Fisch, C.–Block, Joerc H. (2018): Six Tips for your (systemic) literature review in business and maagement research. *Management Review Quarterly,* 68., (2), pp. 103–106. DOI: 10.1007/s11301-018-0142-x

[8] Clark, W. R.–Clark, L. A.–Raffo, D. M.–William, Jr. R. I., (2020): Extending Fisch and Block's. (2018) Tip for a Systematic Review in Management and Business Literature. *Management Review Quarterly,* 71. (1.). DOI: 10.1007/s11301-020-00184-8

[9] Black, J. K. (1977): Development and Modernization Theory: a critical review. *CrossCurrents,* 27., (1.), pp. 41–56. http://www.jstor.org/stable/24458299

The Brundtland Commission believes that widespread poverty is not only an evil in itself, but sustainable development requires meeting the basic needs of all and extending to all the opportunity to fulfill their aspirations for a better life. A world in which poverty is endemic which misappropriated measurement promotes, will always be prone to ecological and other catastrophes. [10] When levels of poverty in a country are high, either because per capita income is low or badly distributed, then there is a problem. They proposed Human Development defined as enlarging people's choices in a way that enables them to lead longer, healthier, and fuller lives as the central objective of human activity and economic growth, and a potentially important instrument for advancing it. While this two-way relationship between HD and EG may now be widely accepted, the specific factors linking them have not been systematically explored.

Nor has the question of priorities in the phasing of policy. They decry that in policy phasing assumption that EG takes precedence over progress on HD, they insist that human development should be given sequencing priority. [11] Examines how tensions between the pursuit of growth and the pursuit of sustainability might be reduced using conceptual resources drawn from established approaches to national accounting and GDP. Using data from 1970 to 2019, Stjepanović–Tomić–Škare [12] examine the convergence of Green GDP and the presence of convergence clubs for 160 nations worldwide.

They present Green GDP as an alternative measure of a country's economic activity that incorporates correcting numbers for environmental degradation, exploitation of natural resources, and waste production. As a result, the legislation aims to adjust the current GDP to address these vital environmental factors. The challenge of escalating global pollution, and expanding environmental effects, examining economic activity to include all significant aspects is crucial. Green GDP is a metric that corrects the traditional GDP and provides a new picture of economic growth and development.

Creating a positive association of stringent ecological policy with the growth of Green GDP indicates that proactive policy measures towards the environment are not only helpful for the environment but also raise better economic conditions in the long run [12]. As part of their results, utilizing each country's GDP as the observed parameter reveals the existence of ten clustering clubs; however, when Green GDP is employed as the observed parameter, only nine clustering clubs are identified common language.

[10] Ranis, G.–Stewart, F.–Ramirez, A. (2000): Economic Growth and Human Development. *World Development,* 28., (2.), pp. 197–219. https://doi.org/10.1016/S0305-750X(99)00131-X.

[11] O'Donovan, N., (2024): Turning less into more: Measuring real GDP growth in the green tansition. *Ecological Economics,* 224., https://doi.og/10.1016/j.ecolecon.2024.108293.

[12] Stjepanović, S.–Tomić, D.–Škare, M. (2022): A new database on Green GDP;
1970–2019: a framework for assessing the green economy. *Oeconomia Copernicana,* 13., (4.), pp. 949–975. doi:10.24136/oc.2022.027

Others are the System of Global and National Accounts (SGNA). The SGNA has four system accounts (environment, society, economy, and distribution), which describe how the systems are developing.

However, this does not yet tell people whether the developments are good or bad [13]. More measurements exist than the allowed space for the study

Communication for Development as an Alternative Progress Measurement Tool

Development communication is essentially about the deliberate use of communication to promote development [14]. As simple and straightforward as this definition seems in settling the salience of communication for more sustained development, conceptual challenges are an obstacle to reaching a consensus. Among other issues, unequal power relations impact psycho-socially in manifestation regarding the two main terms that make up the concept of development for communication. Conceptual parochialism in the way that development has been viewed as modernization. Black [9] takes a swipe at Western scholarly perspectives on their conceptualization of development from a modernization perspective as ethnocentric.

The dichotomy of developed and underdeveloped nations as seen from the lenses of modernization and GDP measurement gave room for emotional detachment and gave the further advantage of maintaining *that we are examining a phenomenon too complex for the poor and uneducated to understand* [9]. The power relations also is the foundation of interplay in the communication aspect of the dictum. Identified in vertical communication, with inherent characteristics unsuitable for effective communication. A presumptive superiority; manifests itself in certain characteristics which Gálvez–Casanova [15] explain as (1) the presumptions that the sender holds all the necessary knowledge for the ongoing communication (2) the sender has information that the receiver does not have (3) because the message is sent through channels holding codes common to the sender and the receiver that the message has been effectively communicated. Also the age-long admonition by Bernard Shaw that the biggest error in Communication is the assumption that it has taken place.

[9] Black, J. K. (1977): Development and Modernization Theory: a critical review. *CrossCurrents,* 27., (1.), pp. 41–56. http://www.jstor.org/stable/24458299

[13] Hoekstra, R. (2019): Replacing GDP by 2030. In: *Replacing GDP by 2030: Towards a Common Language for the Well-Being and Sustainability Community.* Cambridge: Cambridge University Press.

[14] Odoom, D. (2020): Understanding Development Communication: *A Review of Selected Literature.* EHASS by Noyam Publishers. pp. 37–48. DOI: https://doi.org/ 10.38159 ehass. 2020054 [Accessed: Nov 17, 2024].

[15] Gálvez, R. O.–Casanova, J. V. (2019): *Voices with Purpose; A Manual on Communication Strategies for Development and Social Change.* Windhoek: Freidrich-Ebert-Stiftung (FES) Fesmedia Africa.

This assumption is inevitably obvious in the assumptive one-way traffic of information sharing when the intent is for a two-way sending and feedback between the sender and receiver. Mindfulness is required for communication to be established, it helps the communication expert avoid unintended consequences which are the bane of communication errors [16].

Regardless of the misinterpretations of these terms that make up Communication for Development; correct application can make for the best solution to development dilemmas and progress measurements. The first challenge of development tackled by communication for development is that projects mindfully superintended via development communication would not have been misappropriated, rejected, abandoned, or avoided by the beneficiaries because the communication stages of the project are grounded in the needs assessment. Because of the role of ownership in the project conceptualization.

Historically grounded in the post-World War 11 rebuilding of nations and the United Nations Organization and development initiative for developing nations. Intervention failures led to the advocacy for the participatory aspect of effective communication for development an indication of fluidity of the concept and its grounding as a discipline of its own. Noted to have been conceived by Childers of the UNDP in the 1960s. He posits that development programs would be successful if done with development support communication with communication experts at the core of the mobilization of the beneficiaries of the proposed projects.

Communication for Development is a sustainability-driven approach which accounts for why scholars of the concept are mostly all caught up in sustainability discourse [17]. According to Mefalopulos [18], its interdisciplinary nature makes development communication an extremely effective cross-cutting investigative tool, making a difference in enhancing project results and sustainability.

Development from the lenses of development communication scholars is a multidimensional process involving major changes in social structures, popular attitudes, and national institutions, *culminating* in the acceleration of economic growth, the reduction of inequality, and the eradication of poverty [19]. Moemeka [20] calls it "a change for the better in human, cultural, socio-economic and political conditions of the individual and consequently of the society".

[16] Ibid

[17] Inyang, M. J. P.–Alegu, J. C.–Maku, B. S. (2020): Development Communication Process and Theories: An Overview. *GNOSI: An Interdisciplinary Journal of Human Theory and Praxis,* 3., (1.), DOI: https://doi.org/10.5281/zenodo.3883592

[18] Mefalopulos P. (2008): *Development Communication Sourcebook: broadening the boundaries of communication.* Washington DC.: The World Bank.

[19] Todaro, M. P.–Smith, S. C. (2015): *Economic development.* 12th Edition. New Jersey.

[20] Moemeka, A. A. (1989): Perspective on development communication. *Africa Media Review.* 3., (3.).

For Israel (2018) it is a process that creates growth, progress, and positive change, *with evidence* of physical, economic, environmental, social, and demographic components". Similar to the position of Inyang et al. [21] “a process of positive change, transformation or improvement of the overall wellbeing of an individual, a people, nation or society at large.” A popular proverb, ’experience is the best teacher’ by Julius Caeser, comes apt to justify the following definitions from ODAs. It is necessary to understand development communication from the perspectives of this group because they learned from experiencing the failure that comes with imposing development on a population. A form of conceptual parochialism, led to the reversal and embracing of communication for development. According to the World Bank [22], it refers to the integration of strategic communication in development processes, and programs based on a strong understanding of indigenous realities. Through the creation of mechanisms to broaden public access to information on reforms; strengthening clients’ ability to listen to their constituencies and negotiate with stakeholders. FAO [23] conceives it as a social process, intentionally designed to seek a common understanding among all the participants of a development initiative, to create a basis for concerted action. That assists with dealing with social processes based on dialogue using a wide range of tools and methods. To seek change at different levels including listening, building trust, sharing knowledge and skills, building policies, debating, and learning for sustained and meaningful change.

The various areas of intervention and the applications of development communication go beyond the traditional notion of behavior change [24].

Development communication is concerned with using communication to change or improve the lives of people it plays a very significant role in explaining the development process to the common people in such a way that it finds acceptance [14]. Development communication is concerned with the dissemination of relevant information that increases people's stock of knowledge and changes their attitudes and values to enable them to undertake and participate in their development process [25].

Inyang Alegu and Maku [17] outline some operational core attributes of C4D as Responsiveness, democratic participation, common ground, education, and simple and relevant language. in addition to these, I identify value orientation, ownership protection, and maintenance

[14] Odoom, D. (2020): Understanding Development Communication: *A Review of Selected Literature.* EHASS by Noyam Publishers. pp. 37–48. DOI: https://doi.org/ 10.38159 ehass. 2020054 [accessed Nov 17, 2024].

[17] Inyang, M. J. P.–Alegu, J. C.–Maku, B. S. (2020): Development Communication Process and Theories: An Overview. *GNOSI: An Interdisciplinary Journal of Human Theory and Praxis,* 3., (1.), DOI: https://doi.org/10.5281/zenodo.3883592

[21] Inyang, M. P.–Alegu, J. C.–Iorlaha, L. Y.–Adelaja, K. I.–Maku, B. S. (2019): *Fundamentals of development communication and national development.* Abakiliki: Mcee Graphics Nig.

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[24] UNICEF (1999): Towards better programming. A handbook on behavior development communication in Water and Environmental Sanitation Programmes.Unpublished document, *UNICEF WES Technical Guidelines Series*, 4., Programme Division Guideline Series, New York.

[25] Anaeto, S. G.–Solo-Anaeto, M. (2010): *Development communication: Principles and practice. Ibadan: Stirling-Horden Publishers Ltd.*

Figure 1. Attributes of Communication for Development

Conclusion

The important place of progress measurement for growth cannot be overemphasized, results of measurements show where the present state of things so that improvement plans can be made. It however is a big challenge when the measurement tool does not measure what is relevant, then there can be no room for improvement. A real commitment to a sustainable future is to insist on using the right measurement tools to gauge the state of growth. While there is no existing research calling for development communications systems to be developed as an alternative measurement tool for measuring the progress of a nation. The concept and its attributes which are stakeholder-centered are suitable to be adapted into such a measurement tool for more sustainable growth measurements. GDP does not measure worthwhile things. It is time to begin to adopt the right tool for the right things. The attributes of development for communication puts it in the class of providing instruments of measurement.

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FALUS ORSOLYA *– CZUKOR KRISTÓF **– DÓSÁNÉ PAP GYÖRGYI ***

A unique banking technique in the service of ethics and sustainability: the "public benefit account"

* *Dunaújvárosi Egyetem, Társadalomtudományi Intézet, Dr. habil. PhD; associate professor; honorary professor;*
Email: faluso@uniduna.hu;

** *Dunaújvárosi Egyetem, Társadalomtudományi Intézet, PhD; assistant professor;*
Email: czukor.kristof@gmail.com

*** *Dunaújvárosi Egyetem, Társadalomtudományi Intézet, lecturer;*
Email: dosanpgya@uniduna.hu;

Motto: *: "O, you who believe, do not consume riba, doubled and multiplied, but fear Allah."* (Qur'an 3:130)

Összefoglalás: A Saría, mint tradicionális iszlám jog, amely a Korán előírásaira és a Szunnákból levonható tanulságokra épül, egyértelműen tiltja kamat *(riba)* kikötését. A speciálisan Saria-kompatibilis eljárásrenddel rendelkező iszlám pénzügyi intézmények ezért alakították ki a "Public Benefit Account" (közhasznú/jótékonysági számla) lehetőséget, annak érdekében, hogy a Saría által tilalmazott *(non-halal)* tranzakciókból származó és a kamatalapú bevételeket oly módon tisztítsa meg, purifikálja, hogy azokat közhasznú, jótékony célokra adományozza. Ez a jógyakorlat nagyban járul hozzá az iszlám bankszektor társadalmi szempontú fenntarthatóságához.
Kulcsszavak: Saría; iszlám bank; „Public Benefit Account"; kamat; társadalmi fenntarthatóság.

Abstract: Sharia, as a traditional Islamic law based on the Quran and the Sunnah, clearly prohibits the charging of interest *(riba)*. Islamic financial institutions with specially designed Sharia-compliant procedures have therefore developed the "Public Benefit Account" option to purify interest-based income from transactions prohibited by Sharia *(non-halal)* and to donate it to charitable purposes. This good practice greatly contributes to the social sustainability of the Islamic banking sector.
Keywords: Sharia; Islamic bank; "Public Benefit Account"; interest; social sustainability.

Introduction

The operation of the Islamic Banking transactions has to be compliant with *Shariah*, the traditional Islamic Law. Islamic financial institutions have to prohibit *Riba* (interest), because it is *Haram* /forbidden by Allah/ [1]. Innovative products and services of Islamic Banking had been widely reported. The products include *Mudarabah* that is profit and loss sharing. Profit and loss sharing /PLS/ is the method utilized in Islamic banking to comply with the prohibition of interest. The Islamic solution, commonly referred to as PLS [2], suggests an equitable sharing of risks and profits between the parties involved in a financial transaction. In the PLS method banking business, there are so three parties. The customers are treated as partners who invest either labor or an equal portion of capital [3, 4]. The most distinguishing features of an Islamic bank, which differentiates it from a conventional bank, is to be free of the most deadly forbidden elements of over usury */Riba/*, uncertainty */Gharar/* and gambling */Maysir/*, also to avoid conducting other unlawful trading methods. Ensuring effective Shariah compliance, however, is not a straightforward matter. As financial markets are frequently becoming sophisticated, intensified product innovations and engineering in Islamic finance entail the genuine concern over the need to strengthen Shariah compliance throughout the product life cycle. Indeed, failure to comply with Shariah not only invokes financial risk but also may eventually expose the Islamic bank to the risk of breaking the trust and confidence of investors and depositors [5].

If we accept that two of the key pillars of sustainability are the long-term sustainability of economic and social development [6], then we can see that the values - including primarily charity as a means of eradicating poverty and hunger and eliminating social inequalities - conveyed by Islamic banks can play significant role in the development of such a financial sustainability strategy.

[1] Falus, Orsolya (2020): *The Legal Institutions of Charity in the Traditional Islamic Law.* Sarajevo: Dobra Knjiga.

[2] Gholami, R.–Aisyah, Abdul-Rahman–NOR Ghani, Md Nor–Fathin, Faizah Said (2021): Profit-Loss Sharing versus Interest-Based Contract: A Systematic Review. *International Journal of Economics, Management and Accounting,* 29., (2.), pp. 381–407. https://doi.org/10.31436/ijema.v29i2.901

[3] Sutrisno, Sutrisno–Widarjono, Agus (2022): Is Profit–Loss-Sharing Financing Matter for Islamic Bank's Profitability? The Indonesian Case. *Risks,* 10., (11.), pp. 207–219. https://doi.org/10.3390/risks10110207

[4] Abdalla, Ahmed G. (2008): The Implication of Using Profit and Loss Sharing Modes of Finance in the Banking System, with a Particular Reference to Equity Participation (Partnership) Method in Sudan. *Humanomics,* 24., (3.), pp. 182–206.

[5] Mukhibad, Hasan–Nurkhin, Ahmad–Anisykurlillah, Indah–Fachrurrozie, Fachrurrozie–Jayanto, Prabowo Yudo (2023): Open innovation in Shariah compliance in Islamic banks – Does Shariah supervisory board attributes matter? *Journal of Open Innovation: Technology, Market, and Complexity,* 9., (1.). https://doi.org/10.1016/j.joitmc.2023.100014.

[6] Falus, Orsolya (2024): Thoughts on legal sustainabilty – 'Nihil sub sole novum.' *Russian Law Journal,* 12., (2.), pp. 51–59.

The Public Benefit Account

Shariah compliance is a fundamental requirement of Islamic Financial Institutions (IFIs). Under the current practices of IFIs, it is the duty of Shariah departments along with the Shariah Supervisory Board (SSB) to monitor, audit, check, certify and approve financial products and services offered according to the requirements of Islamic financial laws [7]. When a financial transaction is found to be in violation of the Shariah, the SSB will accordingly need to decide whether the financial transaction is void; or needs to be rectified; or its cost shall be borne by the IFI and/or the profit earned represents Shariah non-compliant (SNC) earnings [8].

In Islamic banking thus a Shariah Governance Framework is operating. Illegal funds are kept in an independent account which is open in the bank's books called the Charity Account (or Public Benefit Account) [9]. Unstandardised practice is also reflected in the lack of a common name for the account within the industry. There are several terms used in the literature to name the account in which funds are pooled and transferred by the IFI for such charitable contributions. These are: Charity Funds [10], Public Benefit/Charity Account [11] and Welfare Account [12]. For the purpose of this article, the term charity account is preferred as it is believed that this term reflects the most accurate definition of it.

In Islamic banking unlawful incomes still mistakenly procures through some impermissible means. Illegal funds are created either by unintentional forms such as interest on bank deposits with other banks or by foreseen forms such as delay penalties, but not limited to: interest from open accounts of the bank with the Central Bank, traditional banks or other institutions, as some banking laws require that the depositor be entitled to interest on deposits calculated on the basis of balance and duratio; the delay penalties that the debtor bank is required to pay, in accordance with the approved financing contracts and agreements; compensation and surpluses established for the benefit of the bank by the court order for amounts overdue; or the

[7] Laldin, m.a.–Furqani, H. (2018): Islamic Financial Services Act (Ifsa) 2013 and the Shariah-Compliance Requirement of the Islamic Finance Industry in Malaysia. *Isra International Journal Of Islamic Finance,* 10., (1.), pp. 94–101.

[8] Al-Ali, Salim Ali (2022): Charity account in Islamic financial institutions: creating a defined Sharī'ah standard. *International Journal of Islamic Finance,* 14., (3.), 315–332. https://doi.org/10.1108/IJIF-01-2021-0007

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[10] Hussain, I. (2011): "Effective Insolvency Regimes For Islamic Finance: The Pakistan Experience" In: Islamic Financial Services Board (Ed.): *Effective Insolvency Regimes: Institutional, Regulatory And Legal Issues Relating To Islamic Finance.* Kuala Lumpur.

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Available at: http://aaoifi.com/shariah-standards3/?Lang=en (Accessed 20. September, 2024)

[12] Noor, A.–Haron, M. (2016): A framework for determination of actual costs in
Islamic financing products. *Journal of Islamic Finance,* 5., (2.), pp. 37–52.

profits of the finance and the financial operations in which the violation occurred, after reviewing and verifying the internal audit department or the external legal auditor and after the approval of the Shariah Supervisory Board (SSB). General provisions should be initiated in order to avoid the non-halal incomes: first, the bank must make a profit from graft in all its transactions, and seek not to enter it in any way. In the form of the collection of a Haram reward, it must be avoided in the Public Benefit Account; second, the bank must ensure that all agreements and contracts with other parties are free from prohibited conditions such as Riba-based interest, etc. under any circumstances and under any name. The bank shall take the initiative to dispose of the forbidden funds by distributing them in the good and public interest, and not to annex them to their assets or to benefit from them in any way of utilization; and third, it is not permissible to confuse the accounts of Zakah /donation/ [1], the donations paid by the bank if any, and the Public Benefit Account, but each of them shall have a special account, which shall direct its amounts to its legitimate banks [9]. The bank, however, may not refund Riba-based interest, which may be settled in its account without agreement with other banks, to the party that paid it, and it shall be included in the Public Benefit Account.

Every time a Minutes of Meeting has to be presented at the first meeting of the Shariah Supervisory Board (SSB). The bank shall establish the Committee for the Conduct of Public Benefit, which studies the demands received and determine their priority. This committee also determines the parties to which the funds will be disbursed and the amounts to be utilized for each entity. The committee consists of the General Manager; the Director of Public Control Pole; the Compliance Manager (Rapporteur of the Committee); and the Director of Product Pole and Quality [13].

[1] Falus, Orsolya (2020): *The Legal Institutions of Charity in the Traditional Islamic Law.* Sarajevo: Dobra Knjiga.

[9] Yunus, S. B. M. (2015): Purification of Non-Halal Incomes by Islamic Banks in Malaysia: *A Shariah analyses.* Selangor: International Islamic University Malaysia.

[13] Grassa, R. (2013): Shariah Supervisory System in Islamic Financial Institutions. *Humanomics,* 29., (4.), pp. 333–348. Https://doi.org/10.1108/h-01-2013-0001

The Activities of the Committee for the Conduct of Public Benefit

A majority of its members shall take decisions of the Committee for the Conduct of Public Benefit. The Committee shall consider the requests for assistance received by the bank, as well as decide and confirm its decisions. Building on the above, this Committee discusses the purification of non-halal income from modern sources. According to them, the bank has to purify such income in order to avoid the sins of keeping the unlawful money and preventing them from utilizing it. The bank shall expedite the disbursement of the funds of the Public Benefit Account. However if disbursement from the Public Benefit Account requires certain procedures or approvals, it will be delayed as needed [11; 14].

The bank is also obliged to disburse a certain percentage of the account balance within one year from the date of collection. The allocation of a sum of money from the Public Benefit Account shall be credited to an account with the bank on behalf of a certain entity and approved under this policy. Meanwhile, it is not permissible to invest public benefit funds in an investment account or any other account. If any profit is realized from a provision made to a party, from a Public Benefit Account, it is credited to the concerned party and the bank is not entitled to any of it. A Public Benefit Account may be disbursed to assist those who have a formal license in the activity with a full legal file and for those having activities within one of the following sectors: construction, renovation and furnishing of educational and public; the field of training, training and scientific research that benefits the society provided that the training is for non-employees of the bank who are trained for the general benefit and dissemination of Islamic sciences; charity activities /such as care for orphans, elderly people, disabled persons, etc./; contributing to the launching of micro-projects for the disabled, people in need, orphans, etc.; applications are subject to medical or surgical intervention for those in need; the active bodies in the field of teaching Quran and for khateeb /a person who delivers the sermon; literally: narration/ [15]; and supporting scientific research in the field of Islamic studies [16].

[11] Aaoifi (2020): *E-Shari'ah standards, accounting and auditing organization for Islamic financial institutions.* Available at: http://aaoifi.com/shariah-standards3/?Lang=en (Accessed 20. September, 2024)

[14] Meutia, Inten–Aryani, Desi–Widyastuti, Sari Mustika (2019): Characteristics of the Shariah Supervisory Board and its Relevance to Islamic Social Reporting at Islamic Banks in Indonesia. *Ekuitas,* 3., (1.), pp. 130–147. https://doi.org/10.24034/j25485024.y2019.v3.i1.4160

[15] Hirschkind, C. (2006): *The Ethical Soundscape: Cassette Sermons and Islamic Counterpublics.* New York: Columbia University Press

[16] Aribi, Z. A.–Arun, T. (2015): Corporate social responsibility and Islamic financial institutions (ifis): Management perceptions from ifis in Bahrain. *Journal of Business Ethics,* 129., (4.), pp. 785–794.

The bank shall pay the public benefit amounts according to the priority of the sectors already mentioned. The first three points shall account for 80% of the amounts spent annually from the account, and the remaining 20% shall be spent on the last three sectors. In addition, the disbursement procedures shall be determined from the account for each sector mentioned above in a detailed disbursement manual showing the required documents and the manner of disbursement. Likewise, the beneficiary should send a report on the use of such funds, supported by evidence. Additionally, no payment may is allowed to be made without the approval of the Committee, and the funds of the account can not be used to put files in retroactively. As for taxes on the funds of the public benefit account, it may be paid from it. Whereas, this shall not apply to taxes levied on the assets of the bank. It is permissible to dispose of the Public Benefit Account for the purchase of a property or movable property and to grant it to a charity. The bank's conduct with these funds and its consequences must be disrupted, because the exit of the bank to the disposal of the charity is achieved by the due disposal of these funds [8].

Consequently, it is not permissible to dispose of the Public Benefit Account with respect to the bank's direct or indirect benefit, or the provision of any expenses, including payment of interest accounts correspondents or taxes incurred by the bank in its work and activities. Moreover, the bank is not allowed to reduce the due performance regarding to the amounts disbursed or for training the bank's staff in particular, or research and studies related to the bank's business. Besides, the Public Benefit Account cannot be used for protection of the real value of bank funds from the effects of currency fluctuations or to deposit amounts that the bank is required to put in the Central Bank or other bank. In addition, it cannot be used in the performance of fees or amounts to which the Bank is committed to contribute to the subscription of its share in the Bank Deposit Guarantee Fund or others or as support for non-performing loans, as well as to write off the deceased or doubtful debts. It is also not permissible to take the Eid / Eid al-Adha, also called the Festival of Sacrifice, is the second of two Islamic holidays celebrated worldwide each year - the other being Eid al-Fitr- and considered the holier of the two/ [17] sacrifice from the account of public benefit because it is a religious rite, in which Muslims draw close to their Lord. Moreover, it is not allowed to lend from the Public Benefit Account, because this is a deliberate delay in paying it, and if the person who is to be lent from it is in need, it should be given instead of lending it [11, 8].

[8] Al-Ali, Salim Ali (2022): Charity account in Islamic financial institutions: creating a defined Shari'ah standard. *International Journal of Islamic Finance,* 14., (3.), 315–332. https://doi.org/10.1108/IJIF-01-2021-0007

[11] Aaoifi (2020): *E-Shari'ah standards, accounting and auditing organization for Islamic financial institutions.* Available at: http://aaoifi.com/shariah-standards 3/?Lang=en (Accessed 20. September, 2024)

[17] Esposito, John L. (Ed.) (2003): *The Oxford Dictionary of Islam.* New York: Oxford University Press.

Finally, the bank's staff and its frameworks are not included in the public interest. They are also keen to deepen their knowledge in the field of Islamic banking, as well as providing books, magazines and specialized documents for them in the fields of banking activity and the various social services are not intended for the benefit of the bank's employees. The bank must provide such assistance to its beneficiaries from the budgeted sections. In case of any violation of the above principles or a payment to a party not approved by the SSB and objected thereto, the amounts paid by the bank shall be charged and returned to the General Interest Account [11, 8].

Conclusion

Islamic banks, while providing surplus to their customers, are competitive with conventional Western banks. Their clients in the 21st century are not motivated in their choice primarily by religious fundamentals but rather by the quality of services and the right price-value ratio. However, the functioning of these banks is perceptibly pervaded by moral values, and lay stress on charity as well (Balázs et al, 2019).

Islamic banking as opposed to the conventional Western banking system, is working on the principles of Shariah, the Islamic religious law. It is based on religious and moral foundations, so it has to be free of the most deadly forbidden elements of over usury */Riba/*, uncertainty */Gharar/* and gambling */Maysir/*, also aims to avoid conducting other unlawful trading methods as well. Ensuring effective Shariah compliance, however, is not a straightforward matter. Even Islamic banks can generate a portion of non-halal income through invalidity of contracts that govern certain products, contracts that do not fulfil the pillars and the conditions, unlawful business banking operations and the interest received from conventional banks. The identification of such income is crucial for the purification process, though this is a special moral service that only these banks are able to offer to their clients. The way these banks give the impure income away for charity purposes and their donation process is an example to follow for Western commercial banks as well.

[8] Al-Ali, Salim Ali (2022): Charity account in Islamic financial institutions: creating a defined Sharī'ah standard. *International Journal of Islamic Finance,* 14., (3.), 315–332. https://doi.org/10.1108/IJIF-01-2021-0007

[11] Aaoifi (2020): *E-Shari'ah standards, accounting and auditing organization for Islamic financial institutions.* Available at: http:/aaoifi.com/shariah-standards3/?Lang=en (Accessed 20. September, 2024)

[18] Balázs, L.–Bezrati, R.–Falus, O. (2019): Operating principles of islamic banking In: András, István–Rajcsáni-Molnár, Mónika (Eds.): *East West Cohesion III : Strategical study volumes,* Subotica: Čikoš Group, pp. 32–49.

Since one of the key pillars of sustainability is the long-term sustainability of economic development, we see that the values conveyed by Islamic banks can play a significant role in the development of such a financial sustainability strategy. The Public Benefit Account is one element of the techniques of Islamic banking. In light of this, it is no wonder that IFIs enjoy great popularity worldwide. Taking into account the fact that the Public Benefit Account is suitable for realizing several of the 17 Sustainable Development Goals /SDGs/ of the 2030 Agenda for Sustainable Development of the UN [19], as means of long-term economic and social development, we can conclude that this legal institution of financial law should be studied by the conventional Western banking system as well.

[19] UN (2015): *Sustainable Development Goals /SDGs/ of the 2030 Agenda for Sustainable Development.* https://www.un.org/sustainabledevelopment/sus-tainable-develop-ment-goals/ (Accessed: 28 September, 2024)

https://doi.org/10.63684/dk.2025.05.06

GULAR MIKAYILOVA*

Innovations in advertising management and their impact on tourism organizations

Abstract: The article examines the role of modern innovations in advertising technologies and their impact on the tourism industry. In the conditions of globalization and rapid development of technology, advertising strategies become the main factor that attracts customers and increases the competitiveness of tourism companies. Special attention is paid to digital marketing, content platforms, social networks and personalized advertising campaigns, which are important in generating tourism demand. At the same time, the article focuses on how innovative approaches in advertising management contribute to increasing brand awareness, strengthening customer trust and increasing sales in the tourism sector. The study analyzes current advertising trends such as Artificial Intelligence (AI), Big Data, Virtual Reality (VR) and Augmented Reality (AR), and their impact on consumer behavior. In addition, the article discusses the main challenges tourism organisations face when implementing innovations in advertising and provides recommendations for the effective use of innovative solutions to achieve strategic business goals.
Keywords: Advertising, management, innovation, tourism, strategy, technology.

Összefoglalás: A tanulmány a modern innovációk reklámtechnológiában betöltött szerepét és a turizmusra gyakorolt hatásait vizsgálja. A globalizáció és a technológia rohamos fejlődésének körülményei között a reklámstratégiák válnak a fő tényezővé, amelyek vonzzák az ügyfeleket és növelik a turisztikai cégek versenyképességét. Különös figyelem irányul a digitális marketingre, a tartalomplatformokra, a közösségi hálózatokra és a személyre szabott reklámkampányokra, amelyek fontosak a turisztikai kereslet generálásában. A tanulmány ugyanakkor arra fókuszál, hogy a reklámmenedzsment innovatív megközelítései hogyan járulnak hozzá a

* *Master of Azerbaijan University of Tourism and Management*
Email: mikayilova.gular@mail.ru

márkaismertség növeléséhez, az ügyfelek bizalmának erősítéséhez és az eladások növeléséhez a turisztikai szektorban. A tanulmány az olyan jelenleg használatos hirdetési trendeket elemzi, mint például a mesterséges intelligencia (AI), a Big Data, a virtuális valóság (VR) és a kiterjesztett valóság (AR), valamint ezek hatása a fogyasztói magatartásra. Ezen túlmenően tárgyalja azokat a fő kihívásokat is, amelyekkel a turisztikai szervezetek szembesülnek az innovációk reklámozása során, és ajánlásokat ad az innovatív megoldások hatékony felhasználására a stratégiai üzleti célok elérése érdekében.
Kulcsszavak: Reklám, menedzsment, innováció, turizmus, stratégia, technológia.

Introduction

Advertising is a special type of activity that has accompanied mankind throughout the history of development. It is a kind of relationship between producer and consumer. The purpose of advertising is to increase demand for the services or goods it advertises.

All over the world, advertising is developing at great speed, involving areas such as industry, production or economy. In this regard, a new type of activity – "advertising work" appeared. High-quality management of activities in the service sector is considered the key to success and is called "advertising management" [1].

In recent years, innovations in advertising management have played a special role in the development of tourism organizations. Tourism, which is one of the most dynamically developing sectors of the world economy, requires constant changes and the application of innovative approaches to maintain competitiveness in the market. Innovative technologies in the field of advertising open new horizons for tourism companies, improve interaction with customers and increase the impact of marketing campaigns.

Modern technologies have radically changed the ways of promoting services in the tourism industry.

The digital transformation of the advertising industry has led to the active use of tools such as social networks, contextual advertising, SEO and content marketing.

[1]Həsənli, M. (2021): Azərbaycanda rəqəmsal marketinqin inkişafi və onun iqtisadi təsiri. *İqtisadiyyat və Biznes,* 2., (4.), pp. 15–28.

Tourism companies can reach their target audience in real-time and create a personalized experience.

Platforms such as Instagram, Facebook and TikTok are actively used to promote tourism services through photos, videos, live broadcasts and bloggers.

Using advertising platforms such as Google Ads allows tourism organizations to display their offers to users when they are searching for specific destinations, services or offers.

The use of Big Data allows tourism companies to better understand their customers and offer them personalized services. Analysis of data collected from various sources (social networks, search queries, online orders) helps to better segment the audience, create targeted offers and manage advertising campaigns more effectively [2].

VR and AR technologies provide unique opportunities for potential customers to pre-visit a vacation destination or "walk through" hotels without leaving home. Such technologies allow travel agencies to offer more interactive and interesting advertising methods that encourage the purchase of services.

Influencers and bloggers have become an important part of tourism companies' advertising strategies. Micro-influencers, who are more closely connected with their followers and more reliable, play a special role, which makes their advertising more authentic and effective.

Programmatic advertising is the automated acquisition of advertising space using algorithms and user behavior data. For tourism companies, this allows for faster and more accurate delivery of advertising messages to the right audience while minimizing costs [3].

Innovative solutions in advertising management have a significant impact on tourism organizations and provide many advantages:

1. Increasing customer loyalty. Individual approaches and targeted advertising campaigns allow companies to better communicate with customers and offer them relevant and interesting offers. This helps increase loyalty and repeat purchases.
2. Increasing competitiveness. Companies that actively use the latest technologies can offer unique advertising solutions that differentiate them from their competitors. The use of innovations allows us to reduce marketing costs and increase the efficiency of advertising campaigns, which increases their competitiveness in the market.

[2] Quliyev, S. (2020): Rəqəmsal texnologiyalarin turizm sektorunda rolu. *Turizm Jurnali,* 5., (3.), pp. 45–60.

[3] Hamari, J.–Sjöklint, M.–Ukkonen, A. (2016): The sharing economy: Why people participate in collaborative consumption. *Journal of the Association for Information Science and Technology,* 67., (9.), pp. 2047–2059. https://doi.org/10.1002/asi.23552

3. Expanding audience coverage. The Internet and social media have enabled tourism companies to reach the global market. Using targeted advertising campaigns allows you to effectively attract tourists from different parts of the world and thereby increase revenues.
4. Increase conversions and revenue. Using user behavior data and automating advertising processes leads to increased conversions. More precise targeting of the target audience, improved user experience through VR and AR technologies, as well as direct interaction through influencers – all contributes to the increase of revenues of tourism companies [4].
5. Increasing trust in the brand. Tourism companies using new technologies and innovative advertising strategies increase customer trust. For example, using influencers or detailed VR tours of vacation destinations creates a sense of authenticity and engagement, which ultimately strengthens the brand.

Innovations in advertising management are fundamentally changing approaches to the promotion of tourism services. Digitization, the use of Big Data, Virtual Reality and influencers help tourism organizations maintain their competitiveness, expand their customer base and increase revenues. Companies that actively implement innovative solutions gain a significant advantage in the ever-changing market.

Analysis

To analyze the impact of innovations in advertising management on tourism organizations, a study was conducted that included statistical data on the use of various advertising tools and their impact on the revenue and customer base of tourism companies. The focus is on innovative technologies such as digital marketing, contextual advertising, social media and the use of Big Data for personalized campaigns.

[4] Məhərrəmov, A. (2019): *Reklamda yeniliklər və turizm şirkətlərinə təsiri.* Baki: Qanun Nəşriyyati.

Table 1. Use of innovative advertising tools in tourism companies

Advertising tools	Percentage of companies using this tool (%)	Increase in number of customers (%)	Revenue Growth (%)
Social networks (SMM)	85%	40%	35%
Contextual advertising (PPC)	70%	30%	28%
Email Marketing	60%	25%	20%
Big Data for personalized campaigns	45%	20%	18%
Virtual reality (VR)	25%	15%	12%
Augmented Reality (AR)	20%	10%	8%

Source: Prepared by the author.

According to the data, most tourism companies (85%) use social networks in their advertising campaigns. It is also the most influential in increasing customer base (+40%) and company revenues (+35%). Contextual advertising is second in popularity (70%) and also shows significant growth in customers (+30%) and revenue (+28%). The use of virtual and augmented reality technologies remains low, but they are also beginning to contribute to the increase in the number of customers and revenues, which indicates their potential for further development.

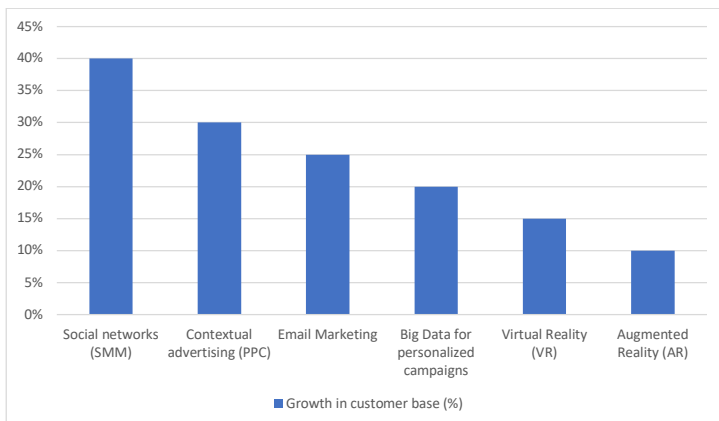
Table 2. The impact of innovations on the competitiveness of tourism companies

Indicator	Before the innovation	After the innovation	Growth (%)
Increasing number of applications	1000	1450	+45%
Converting leads to sales	10%	15%	+50%
Average Customer Cost (CAC)	50 USD	40 USD	-20%
The company's total revenue	500,000 USD	650,000 USD	+30%

Source: Prepared by the author.

The application of innovative advertising technologies led to a significant increase in the number of inquiries from potential customers (+45%) and an improvement in the conversion of potential customers to sales (+50%). Customer acquisition costs (CAC) decreased by 20%, demonstrating the effectiveness of personalized advertising campaigns based on Big Data and Digital Marketing. As a result, the total revenues of the companies increased by 30%, which proves the positive impact of innovations on the financial stability of tourism organizations.

Chart 1. Growth of the customer base of tourism companies after the introduction of innovations in advertising management (in per cent)



Source: Prepared by the author.

The chart clearly shows the increase in the number of customers in tourism companies after the introduction of innovative advertising tools.

The chart shows that the largest increase in the customer base occurred in companies that actively use social networks and contextual advertising. At the same time, virtual and augmented reality technologies have also had a positive impact, but their use requires deeper investment and market adaptation.

Innovations such as the use of Big Data, social networks, and virtual & augmented reality in advertising management significantly affect the effectiveness of marketing campaigns of tourism organizations [5].

[5] Xiang, Z.–Fesenmaier, D. R. (2017): Big Data analytics, tourism design and smart tourism. *Journal of Destination Marketing & Management,* 6., (2.), pp. 109–110. https://doi.org/10.1016/j.jdmm.2017.05.018

The data shows that the implementation of such technologies can improve the accuracy and personalization
of offers, in addition to increasing the reach of the target audience. The following table shows the results of a survey conducted among 50 travel agencies on the level of growth of the customer base after using various innovative technologies.

[6] Məmmədov, E. (2018): *Yaşil texnologiyalar və turizm sektorunda dayaniqli inkişaf.* Baki: Nurlan Nəşriyyati.

Table 3. Survey results

Innovative advertising tools	**Growth in customer base (%)**
Social networks (SMM)	40%
Contextual advertising (PPC)	30%
Email Marketing	25%
Big Data for personalized campaigns	20%
Virtual Reality (VR)	15%
Augmented Reality (AR)	10%

Source: Prepared by the author.

The data in the table confirm that the highest indicators of increasing the customer base were achieved with the help of social networks and contextual advertising, which is due to the wide distribution and accessibility of these tools. At the same time, virtual and augmented reality are promising, but still underdeveloped areas.

In addition to increasing the customer base, the introduction of innovations in advertising management also affects the financial indicators of tourism organizations [6]. The table below shows the average changes in company revenues after using different advertising technologies.

Table 4. Average changes in company revenues

Innovative technologies	Revenue Growth (%)
Social networks (SMM)	35%
Contextual advertising (PPC)	28%
Big Data for personalized campaigns	22%
Virtual Reality (VR)	18%
Augmented Reality (AR)	12%

Source: Prepared by the author

As can be seen from the table, social networks and contextual advertising are leading in terms of revenue growth and confirm their key role in tourism companies' marketing strategies. The use of Big Data also shows significant results, allowing companies to tailor advertising campaigns more precisely to the interests of customers.

Tourism organizations that use innovative advertising methods see a significant advantage over competitors that continue to use traditional channels such as print advertising and television [8]. According to the study, companies that use innovative technologies achieve an average of 20% better results on key indicators: customer growth, increased customer satisfaction and improved brand awareness. The table below shows the results of the comparative analysis.

Table 5. Comparison of traditional and innovative advertising methods

Advertising methods	Increase in number of customers (%)	Customer satisfaction (%)	Brand awareness improvement (%)
Traditional methods (print, TV)	10%	12%	15%
Innovative methods (SMM, VR, Big Data)	25%	30%	35%

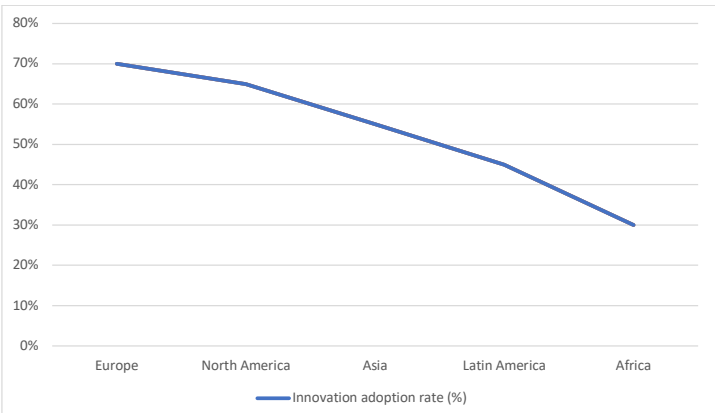
Source: Prepared by the author.

These data show that traditional methods are losing their effectiveness compared to modern innovative approaches that reach a wider audience and build stronger relationships with customers.

The adoption of innovations in advertising management varies by region depending on the availability of technology, the level of digital literacy and the readiness of companies to innovate [7]. In the research, tourism companies operating in several regions were analyzed. Below is a graph showing the level of innovation in different regions.

[7] Schumpeter, J. A. (2013): *Capitalism, socialism and democracy.* New York: Routledge.

Figure 1. The level of implementation of innovations by world regions



Source: Prepared by the author.

As can be seen from the data, the highest level of innovation is observed in Europe and North America, where tourism is actively developing thanks to the application of modern technologies. At the same time, the application of innovative methods in developing regions such as Latin America and Africa still lags behind.

Conclusion

The analysis of statistical data and the use of tables and graphs show that the introduction of innovations in advertising management has a positive effect on the main performance indicators of tourism companies.

These innovations not only increase customer numbers and revenue but also reduce customer acquisition costs. The most effective tools are social networks and contextual advertising, but virtual and augmented reality technologies have great potential for further development

Innovations in advertising management play an important role in increasing the competitiveness of tourism companies in the modern digital economy.

As shown in the article, the use of tools such as social networks, contextual advertising, Big Data technologies, virtual and augmented reality helps not only to increase the customer base, but also to increase company revenues, reduce customer acquisition costs, and increase user loyalty.

The study showed that social networks and contextual advertising currently show the highest effectiveness, while new technologies such as virtual and augmented reality have significant potential for future development. Successful implementation of these tools requires strategic planning, integration of innovative solutions and active monitoring of results.

An important task facing tourism organizations is to adapt to rapidly changing market conditions, which involves constant innovation in marketing strategies. Only companies that can quickly and flexibly react to changes will be able to take a leading position and ensure long-term success.

In addition, it should be noted that the introduction of innovations in advertising management requires tourism companies not only to invest in technology but also to develop new approaches to training employees who will work with these tools. Employees must have skills in working with digital platforms, data analysis and real-time management of advertising campaigns.

In addition, tourism companies must carefully monitor changes in consumer behavior and preferences, as this allows them to adjust their marketing strategies based on current trends. The role of Big Data analytics is becoming key in creating more accurate and personalized offers for customers.

In conclusion, the success of tourism companies in today's environment depends more on their ability to innovate in their advertising processes, which helps to strengthen the brand, attract new customers and increase their satisfaction. Companies that actively use modern technologies and adapt to changes in the market will be able to achieve significant results and strengthen their position in the industry.

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HIRANYA DISSANAYAKE*– HAREENDRA DISSABANDARA**–
ROSHAN AJWARD***– WASANTHA PERERA****

Corporate sustainability: a comparative analysis of pre- and post-COVID–19 practices in Sri Lanka

Abstract: The COVID–19 pandemic significantly disrupted corporate sustainability practices, compelling businesses to reassess their environmental, social, and economic responsibilities. This study evaluates the impact of COVID–19 on corporate sustainability in Sri Lanka by analyzing practices across these three domains using the Corporate Sustainability Index (CSI). A sample of 160 listed and unlisted companies was selected through convenience sampling, and paired samples tests were employed to identify significant pre- and post-pandemic changes. Findings revealed notable declines in environmental initiatives, such as reductions in climate change mitigation efforts and green energy adoption, driven by resource constraints. Social indicators showed mixed outcomes, including decreased workplace flexibility but increased collaboration with non-governmental organizations.

Economic sustainability faced challenges, as evidenced by declines in brand value and financial investments in sustainability initiatives. The results highlight the critical need for businesses to adopt adaptive and resilient strategies that balance immediate recovery with long-term sustainability goals. The study underscores the importance of integrating stakeholder engagement, systemic resilience, and innovative solutions into corporate sustainability frameworks. Recommendations include fostering public-private partnerships, leveraging technology, and prioritizing investments in sustainable practices. These insights provide valuable guidance for businesses navigating post-COVID challenges in a developing economy like Sri Lanka.

Keywords: Corporate Sustainability, COVID–19, Environmental Practices, Social Equity, Economic Resilience, Sri Lanka, Paired Samples Test, Corporate Sustainability Index.

* *Department of Accountancy, Faculty of Business Studies and Finance, Wayamba University of Sri Lanka*
E-mail: hiranya@wyb.ac.lk

** *Department of Finance, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura*
E-mail: dissa@sjp.ac.lk

*** *Department of Accounting, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura*
E-mail: ajward@sjp.ac.lk

**** *Department of Finance, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura*
E-mail: wasantha.perera@sjp.ac.lk

[1] Dissanayake, H.–Dissa Bandara, D.–Pererea, K.–Ajward, A. R. (2023): Bibliometric Analysis on the COVID–19 impact on Corporate Sustainability. *Journal of Financial Studies,* 8., pp. 57–71.

Összefoglalás: A COVID–19-világjárvány zavart idézett elő a vállalati fenntarthatósági gyakorlatokban, és arra kényszerítette a vállalkozásokat, hogy újraértékeljék környezeti, társadalmi és gazdasági felelősségüket. A jelen tanulmány e három terület gyakorlatának elemzésével értékeli a COVID–19 hatását a Srí Lanka-i vállalati fenntarthatóságra a Corporate Sustainability Index (CSI) segítségével. Egy 160 tőzsdén jegyzett és nem jegyzett vállalatból álló mintát választottak ki kényelmi mintavételezéssel, és páros mintás teszteket alkalmaztak a pandémia előtti és utáni jelentős változások azonosítására. Az eredmények azt mutatják, hogy a környezetvédelmi kezdeményezések – például az éghajlatváltozás mérséklésére irányuló erőfeszítések csökkenése és a zöld energia bevezetése – jelentős visszaesést mutatnak az erőforrások korlátai miatt. A társadalmi mutatók vegyes eredményeket prezentáltak, a munkahelyi rugalmasság csökkenését, azonban figyelemre méltó a nem kormányzati szervezetekkel (NGO) való együttműködés fokozódása. A gazdasági fenntarthatóság kihívásokkal szembesült, amit a márkaérték csökkenése és a fenntarthatósági kezdeményezésekbe történő pénzügyi befektetések bizonyítása is mutat. Az eredmények rávilágítanak arra, hogy a vállalkozásoknak olyan alkalmazkodó és rugalmas stratégiákat kell alkalmazni, amelyek egyensúlyt teremtenek az azonnali fellendülés és a hosszú távú fenntarthatósági célok között. A tanulmány kiemeli az érdekelt felek bevonásának, a rendszerszintű rugalmasságnak és az innovatív megoldások vállalati fenntarthatósági keretekbe történő integrálásának fontosságát. Az ajánlások között szerepel a köz- és a magánszféra közötti partnerségek előmozdítása, a technológia kiaknázása, valamint a fenntartható gyakorlatokba való befektetések előtérbe helyezése. Ezek a betekintések értékes útmutatást adnak azoknak a vállalkozásoknak, amelyek a COVID utáni kihívások között navigálnak olyan fejlődő országok gazdaságaiban, mint Srí Lanka.

Kulcsszavak: Vállalati fenntarthatóság, COVID–19, környezetvédelmi gyakorlatok, társadalmi méltányosság, gazdasági rugalmasság, Srí Lanka, páros mintavizsgálat, vállalati fenntarthatósági index.

Introduction

The COVID–19 pandemic has changed societies and economies around the globe and influenced corporate sustainability activities and traditions [1]. For Sri Lanka as a developing economy highly dependent on environmental resources and com-

munity-level business involvement, the pandemic led to both challenges and development enablers. In this research, the authors seek to understand changes in the level of corporate sustainability activities between the pre- and post-COVID –19 eras in both the environmental, social, and economic contexts. In this study, employing a paired sample test, certain trends, issues, as well as future prospects for improvement are revealed.

This paper examines the corporate sustainability practices of firms in Sri Lanka before and after the COVID–19 outbreak. It does this by comparing and analyzing transformative transitions in the environmental (ENV), social (SOC), and economic (ECO) domains and the strategies adopted by corporates to promote sustainability as well as the enduring impact on sustainable frameworks. The primary objective of this research is: To compare pre- and post-COVID–19 practices in environmental (ENV), social (SOC), and economic (ECO) domains based on paired samples tests. At the same time, this analysis focuses on the identification of the key variations to the chosen sustainability indicators, the examination of the potential reasons for these variations, and the suggestions for the improvement of the resilience of corporate practices in question.

Conceptualization of Corporate Sustainability

Sustainability in any organization has gone through various changes over the years, this is due to increasing dynamism in the management of economic, social and responsibilities. This notion stems from the vision put forward by [2], known as the Triple Bottom Line, which also failed to provide much in the way of specific guidance when it comes to handling tensions between various elements of the three dimensions. Ordering the sustainable value chain by [3] decided for stakeholders' perspectives focusing on the existing and future needs. Nevertheless, the definition believed that the stakeholder businesses have mutual objectives, which often might not be so in real life.

Wilson (2003) built on this by connecting business development to the use concept meaning,-profitable that combined profits, protection of the environment, and equal implementation justice. It is, however, practical and reasonable, but silent on how the aforesaid objectives are to be reconciled in case of conflict. Furthermore, [4] provided a systemic approach to corporate sustainability focusing on the changes in philosophy that is required.

[2] Elkington J. (1997): The triple bottom line. In: *Environmental management: Readings and cases,* 2., pp. 49–66.

[3] Dyllick, T.–Hockerts, K. (2002): Beyond the business case for corporate sustainability. *Business Strategy and the Environment,* 11., (2.), pp. 130–141. https://doi.org/10.1002/BSE.323

[4] Meuer, J.–Koelbel, J.–Hoffmann, V. H. (2019): *On the Nature of Corporate Sustainability. Organization and Environment.* https://doi.org/10.1177/1086026619850180

This approach corresponds with current expectations for radical change, but calls for comprehensive frameworks that will allow for enforcement. The three definitions outlined above provide a foundation on which the development of corporate sustainability has been built and show the complexity of what is required of today's business management solutions.

Accordingly, Corporate Sustainability defined as the integration of the business performance expectations including economic, social, and environmental sustainability.

– The term "economic sustainability" refers to policies that enable long-term economic growth without adversely affecting the social, environmental, or cultural components of the community.
– The term "social sustainability" refers to identifying and managing both the positive and negative consequences of business organization systems and processes on individuals and social life.
– The term "environmental sustainability" refers to protecting the natural world, with a focus on conserving the ability of the environment to support human life, which is the goal of environmental policy.

Methodology

This research also uses a quantitative method to measure the variations in sustainability initiatives concerning the environmental, social, and economic sustainability practices of Sri The target sample of the study is 160 companies both the listed and unlisted which are operating in Sri Lanka. Convenience non-probability sampling technique was used in the selection of firms where the authors could easily access and or where the firms readily agreed to participate in the study thus satisfying the basic requirement of adequacy of sample of the study.
It also helped in collecting data within the time constraint and getting views from different settings within the organisations.

The environmental, social, and the economic aspects were employed as sub-indices to measure corporate sustainability. These sub-indices provide a comprehensive framework for evaluating corporate sustainability practices. For the assessment of the companies on the sustainability front the CSI was used which was similar in measurement and methodology to the one used in [5] and [6].

[5] Zhang, J.–Djajadikerta, H. G.–Trireksani, T. (2019): Corporate sustainability disclosure's importance in China: financial analysts' perception. *Social Responsibility Journal,* 16., (8.), pp. 1169–1189. https://doi.org/10.1108/SRJ-10-2018-0272

[6] Gomes, C. M.–Kneipp, J. M.–Kruglianskas, I.–Da Rosa, L. A. B.–Bichueti, R. S. (2014): Management for sustainabi-lity in companies of the mining sector: an analysis of the main factors related with the business performance. *Journal of Cleaner Production,* 84., (1.), pp. 84–93. https://doi.org/10.1016/J.JCLEPRO.2013.08.030

For the purpose of comparing corporate sustainability practices in both pre and post COVID–19 periods, a paired sample test has been employed. The use of this method also enabled the comparison of differences in the sustainability indicators and guidance on the changes that companies applied in terms of direction and operation during the pandemic. The results of the test specified changes within all the three dimensions around sustainability to shed light on the effects of the pandemic.

This methodology provides a strong foundation for the assessment of changes in sustainable practices because the paired test increases the significance of this study for the Sri Lankan context despite the selected convenience sample.

Findings and Analysis

Environmental Sustainability

The pandemic created both positive and negative environmental impacts. While short-term reductions in pollution were noted due to lockdowns, resource constraints affected the continuity of long-term sustainability initiatives. This study found that significant reduction in initiatives related to Climate Change Mitigation Efforts(-0.143, $p = 0.000$). In addition, decline in investments and adoption rates related to Green Energy Adoption (-0.255, $p = 0.000$).

The reduction in environmental initiatives highlights the challenges of maintaining eco-friendly practices amidst financial pressures and disrupted supply chains. All other practices have not observed changes in this period.

Social Sustainability

The social dimension experienced mixed outcomes, reflecting the dual pressures of addressing immediate social crises and maintaining long-term social sustainability goals. This study observed reduction in opportunities for flexible work arrangements (-0.132, $p = 0.001$), likely due to logistical challenges in adapting to remote work. In addition, economic disruptions disproportionately affected vulnerable groups, increasing the Gini coefficient by an average of 6% in developing economies.

On the other hand, increase in collaboration with non-governmental organizations (0.170, $p = 0.000$), showcasing heightened community support and philanthropic activities. All other practices have not observed changes in this period.

Economic Sustainability

Economic sustainability indicators showed significant strain, reflecting the financial challenges faced by corporations during the pandemic. This study observed decline in brand value (-0.096, $p = 0.025$), driven by reduced marketing budgets and shifting consumer priorities. In addition, Resource reallocation toward immediate recovery efforts limited long-term investments in sustainable practices. All other practices have not observed changes in this period.

The pandemic exposed the fragility of environmental initiatives, with corporations scaling back due to budget constraints. While some areas like NGO engagement improved, others, such as workplace flexibility, suffered due to operational challenges. Financial pressures were evident across all sectors, highlighting the need for robust economic sustainability frameworks.

Conclusion

COVID–19 has disrupted corporate sustainability strategies because it has brought changes that make companies reconsider their goals. From the result presented in this study, it shown that there are changes in environmental social economical and other factors where Crisis means adaptability and resilience. The corporate world should thus emulate best sustainable practices that are well balanced and also prepared for future shocks, mostly emanating from the sustainability indicators to enable all the stakeholders achieve the best outcome.

Implication and Recommendation

The pandemic has revealed that the previous practices of institutions and organizations when it comes to sustainability must incorporate resilience. Another factor that explains why new forms of policies are required is that policy needs to be adaptive to cope with situations that contain various sources of uncertainty and disruption.

Recommendations include equitable distribution of resources, privatisation and; application of technology and capacity building and sensitisation. Investments in environmental, social and economic sustainability needs to be platforms to ensure corporations attain capacity to adapt.

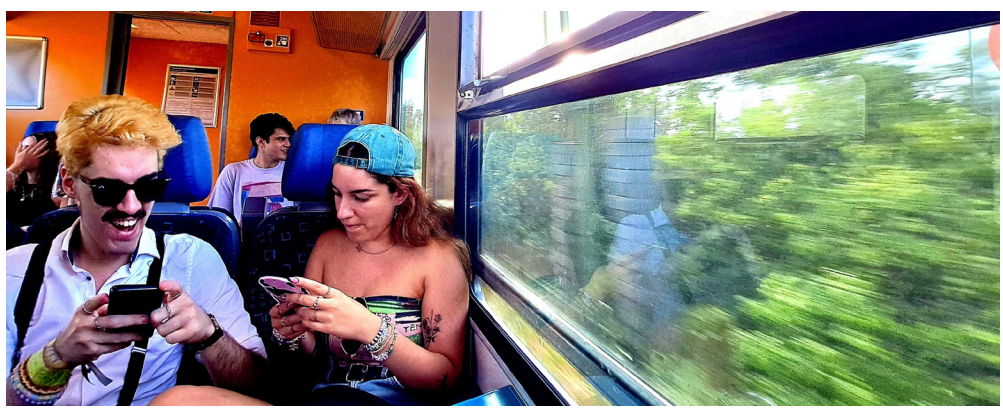
Moreover, create partnerships with business, government, and non-governmental organisations to improve sustainability performance. Subsequently, it is also important to take advantage of Information technology to minimize operational cost, support work-from-home, and monitor the environment. Lastly, Spread more knowledge among the stakeholders toward sustainable practices in the company to ensure people start thinking on sustainable manners.

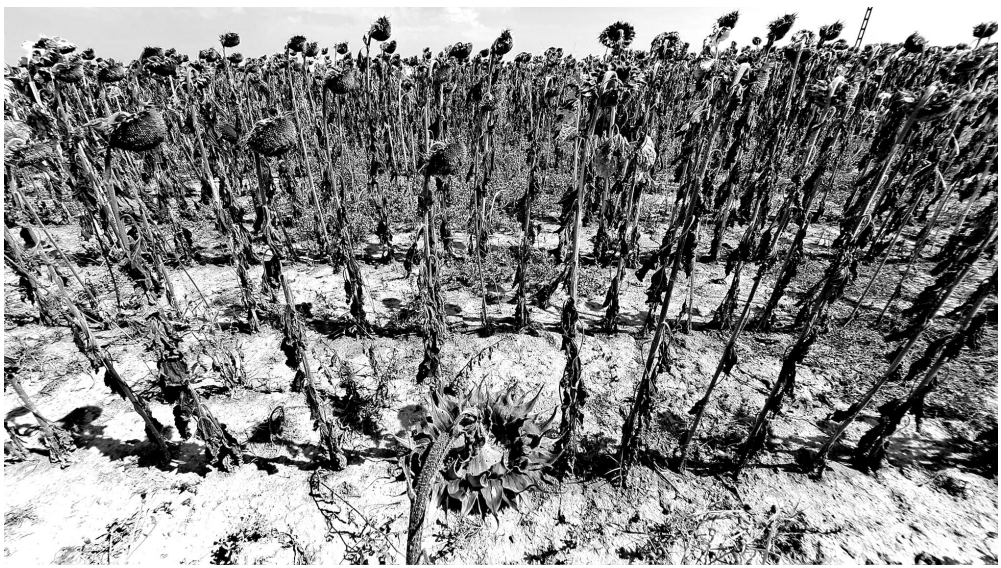
Thus the implication of the findings transcend the Sri Lankan context. The pandemic has brought to the surface the weaknesses of sustainability in corporate frameworks across the world, and the importance of learning from one another. However, the SLM transition to low-carbon and sustainable growth models illustrates that Sri Lanka and other developing countries should follow innovation and disaster risk reduction approaches.

Sustainability should continue to act as a key focus as the world's economy strives to bounce back from the adverse health effects of the COVID–19 pandemic. The experience of the COVID–19 period highlights the need and prospects for configuring goals and objectives to stimulate new development strategies and create sustainable long-term growth that takes into account the nations' social needs, economic prosperity, and environmental concerns.

Galéria

Bakos Miklós



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