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E-KARABAKH AND BEYOND: REVEALING THE DIGITAL LANDSCAPES IN AZERBAIJAN'S LIBERATED TERRITORIES

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Abstract: *Following the second Karabakh War in 2020, Azerbaijan liberated its territories from 30 years of long-brewing Armenian occupation, which today are considered the potential economic and geopolitical landscapes for not only the socio- economic development of the country but to involve foreign investments and projects to these recovered areas. The Karabakh War of 2020 caused a change in the balance of power and status quo in the South Caucasus region as Azerbaijan in recent times started the rehabilitation and reconstruction processes, the placement of IDPs, involvement of investments, launch of tender projects, etc. to provide the socio-economic development of Karabakh region as a future E-Karabakh. The core objective of the paper is to ensure scientific insights and recommendations for the transition of the conventional Karabakh region to the digitalized so-called E-Karabakh region to enhance the economic development of the region. The authors' focus primarily delves into aspects including the advancement of a green economy and green growth policy, agriculture, and fostering a clean ecological environment in Karabakh. The article also analyzes the enhancement of ICT-based infrastructure, the integration of high digital technologies, and the potential emergence of Karabakh as a prominent hub for technology and innovation in the South Caucasus region. The paper aims to fill a gap in the existing literature by presenting valuable insights for government officials, decision-makers, and experts in this field, seeking to be a substantial scientific paper, offering policy-based information to aid in making informed and rational decisions.*

Keywords: *E-Karabakh, digital economy, economic development, Azerbaijan, green growth, innovation and sustainability.*

INTRODUCTION

The digital transformation of economies is a critical issue faced by nation-states worldwide, which involves integrating digital technology into various aspects of society, including businesses, government services, education, healthcare, agriculture, and more. Following the recent conflict resolution in the Nagorno-Karabakh region, the liberated territories of Azerbaijan have emerged as potential zones for significant geopolitical, economic, and infrastructural development. (Muradov &Hajiyeva, 2022; President.az, 2021).

The region is considered ripe for a range of projects, including the establishment of new urban centers, smart cities, and villages, alongside the development of various sectors such as green energy and information and communication technology (ICT) infrastructure. For instance, TEPSCO's strategic "Green Energy Zone" plan in liberated territories highlights sustainable development, emphasizing renewable energy sources for regional growth. ensuring efficient infrastructure restoration, enabling sustainable energy solutions for regional socio-economic advancement. (Aydin, 2023) Masdar and the Azerbaijani government signed Memorandums of Understanding for sustainable energy initiatives, focusing on solar, wind, and integrated solutions for economic growth. The comprehensive agreement between Masdar and Azerbaijan in the Karabakh and East Zangazur economic regions, inclusive of various clean energy ventures, underscores a global collaborative commitment, to fostering green energy technologies for socio-economic progression in the liberated territories. Currently, partnerships are being established with foreign companies in the relevant sectors mentioned above. For instance, SA_Partners, a company headquartered in Zurich, Switzerland, is working on a collaboration that will contribute to economic development and enhancement in the Karabakh region of Azerbaijan. The founding partner of the Swiss company, Dunya Kovari, highlighted their work on urban planning, roads, schools, and residential building construction in the districts of Zangilan, Kalbajar, and Gubadli by preparing the main business plan for these areas. (MineEnergy, 2021)

The revival of traditional economic sectors in the recently liberated territories of Azerbaijan is crucial. Over the next decade, the development of construction, industry, agriculture, and the military industry in the Karabakh region stands as a pivotal and prioritized focus in the contemporary era. Elevating their contribution to the country's GDP holds substantial promise for Azerbaijan's future economic growth. In the present age, a modern economy flourishes on knowledge, scientific advancements, high-tech innovations, and technology. Through technological innovation, the shift from conventional economic structures to an information-based economy is underway, signifying the ongoing modernization of the economy.

METHODOLOGY

Due to the scarcity of scientific papers on the economic development and integration of the Karabakh region, this study relies on qualitative analysis. The technique includes a detailed assessment of information from sources such as the Republic of Azerbaijan's Ministry of Economy, Center for Economic Reforms Analysis and Communication, Presidential reports, and policy papers from important Azerbaijani think tanks. Official reports and policy papers provided by the Ministry of Economy, Presidential reports, and reputable think tanks in Azerbaijan were thoroughly reviewed. The investigation was particularly concerned with comprehending strategies, policies, and goals for economic regeneration and integration in the Karabakh region. This entailed a thorough evaluation of the linguistic material gathered from these papers to extract critical information about the Karabakh region's economic growth objectives, infrastructural strategies, and suggested policies. The emphasis was on establishing important strategies and objectives defined for the region's traditional and digital economy development. This methodology aimed to bridge

the gap in the existing academic literature by consolidating and analyzing information from official reports, supplemented by expert insights and comparative analyses from other regions that underwent post-conflict economic recovery.

RESULTS

The economic revitalization of the Karabakh region in the post-war period has become a focal point for Azerbaijan. (Aliyeva, 2021) Even today, the realization of the idea of Karabakh University, specializing in technical and applied sciences, holds immense promise for regional development. With a curriculum spanning robotics, biotechnology, biochemistry, mechanical engineering, applied physics, and beyond, the institution can spearhead innovation. In robotics, the university may pioneer automation for industries and healthcare. Biotechnology endeavors could yield advancements in crop resilience and biomedical breakthroughs. The exploration of materials science and quantum computing in applied physics can mark strides in technology. By fostering computer science, the university contributes to cybersecurity and software solutions. Civil engineering and environmental science research promise sustainable urban planning, earthquake-resistant structures, and eco-friendly practices. This academic hub is poised to be a catalyst for socio-economic progress. By generating job opportunities and attracting skilled professionals, the university aids economic diversification. Collaborations with industries and global institutions facilitate knowledge transfer, fostering innovation and entrepreneurship. The resulting infrastructure improvements elevate overall living standards. Emphasis on renewable energy, agricultural technology, and space exploration aligns with global sustainability goals. Karabakh University, with its interdisciplinary focus, is positioned not only to address local challenges but also to contribute meaningfully to the broader scientific community, making it a key player in shaping a prosperous and sustainable future for the region.

Table 1. The Azerbaijani government has outlined plans and initiatives to transform the newly liberated areas, emphasizing several key aspects.

Infrastructure Development	There is a major focus on rebuilding and developing the infrastructure, including roads, utilities, and public services, to support the region's growth.
Smart City and Villages Projects	The intent is to create modern, technologically advanced urban centers and villages that leverage digital innovation to enhance living standards and offer sustainable and efficient services to residents.
Green Energy Initiatives	Azerbaijan's goal in the liberated regions is to promote and develop the green energy industry, including projects incorporating renewable energy sources such as solar, wind, and hydroelectric power. This not only promotes sustainable growth but also helps to lessen reliance on fossil fuels.
ICT Infrastructure	Building a strong information and communication technology infrastructure is critical for the development of many industries, stimulating

	creativity, and laying the groundwork for future technical advances.
Agricultural Development - Land Revitalization and Rehabilitation:	Efforts are being made to invest in modernizing and revitalizing agricultural practices, introducing modern technologies and methodologies to increase productivity and output. Many areas have been affected by the conflict and require rehabilitation. This includes land clearance from mines and other hazards, as well as rebuilding irrigation systems and infrastructure necessary for agriculture.
Employment and Livelihood Opportunities:	The revival of the agricultural sector will not only contribute to economic growth but also create employment opportunities for the local population, contributing to their livelihoods.

Source: President.az, Ministry of Economy of the Republic of Azerbaijan, 2023.

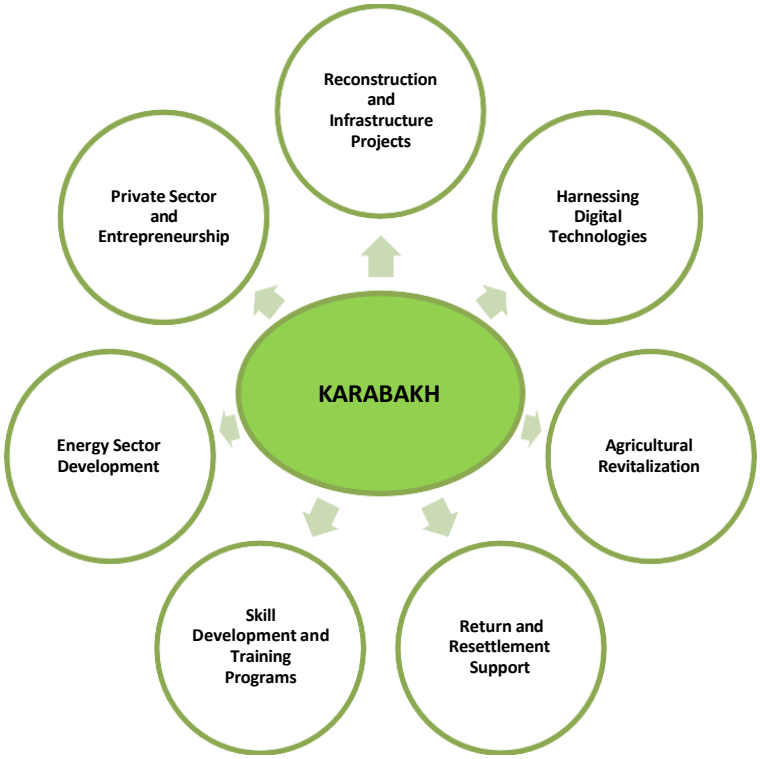
In the post-war period, the Karabakh region of Azerbaijan presented several opportunities related to employment and livelihood. The liberation of these territories opens avenues for economic development, job creation, and improving living standards. The development of both traditional and new sectors holds significant importance in the economic and socio-political contexts of the Karabakh region, aligning with the key national development priorities of the country. The utilization of modern technologies is crucial in understanding the trends in economic development, particularly in establishing a digital technology-driven economy. (Mammadov, et.al., 2022; Aliyev, 2022)

In Karabakh, the notion of "smart villages" symbolizes a strategic paradigm shift aimed at exploiting technology and connectivity to improve rural living conditions. It aspires not only to improve services but also to develop long-term economic prospects in rural communities. The village of Aghali, located in Azerbaijan's liberated Zangilan district, has been recognized as the first smart village in the area, combining advanced technologies with eco-friendly features. The village comprises two to three-story residential buildings, a children's garden, a medical center, a school, a water power station, and various other facilities. The development of Aghali village is based on five key components: housing, production, social services, smart village management, and alternative energy. (Hajiyeva & Karimli, 2021) Currently, the concept of a smart village in Aghali is preparing to introduce innovations in Azerbaijan's rural development sector. Additionally, several offices have been established in Aghali, including Azərpoçt (Azerbaijan Post), the "ASAN Service" multifunctional social service center, the "DOST" social support center, and the Small and Medium Entrepreneurship Development Center. This creative strategy is much more than just implementing cutting-edge technology. It is a determined effort to bridge the urban-rural gap by bringing sophisticated city services to the rural setting. (Muradov & Hajiyeva, 2022)

The goal of integrating network-driven operations is to simplify and improve various services within villages. Furthermore, the effort aims to reduce urban migration by making rural areas more appealing to residents. It envisions a situation in which contemporary amenities and efficient services are seamlessly incorporated into the fabric of traditional

village life, producing an atmosphere conducive to the growth of small and medium-sized businesses. This, in turn, creates opportunities for employment and economic growth in rural communities in the liberated territories. Based on initial projections, the Karabakh economic region is anticipated to yield an approximate 10% increase in value within the agricultural sector. This surge is expected to significantly propel the growth rate of not only the agricultural industry but also the broader economy of Azerbaijan.

Figure 1 depicts the core spheres of socio-economic integration and development of the Karabakh region.



Source: Ministry of Economy of the Republic of Azerbaijan, 2023. (President.az, 2022)

Table 2. Digital Landscape Opportunities in Karabakh

Possibilities/Advantages	Description	Impact Rating
Economic Development	Attracting digital businesses and investments in the region. Job creation through the establishment of technology and IT companies.	+++
Infrastructure Improvement	Development of digital infrastructure such as high-speed internet and data centers. Integration of smart city technologies for improved services.	++
Educational Opportunities	Establishment of technology-focused educational institutions. Access to online learning resources and programs.	+++

Cultural Preservation	Digital archives for preserving and showcasing cultural heritage. Virtual museums and exhibitions to promote local art and history.	++
Tourism Enhancement	Virtual tourism experiences to attract a global audience. Digital platforms for promoting local tourism and attractions.	++
Connectivity and Collaboration	Improved communication and collaboration between communities. Integration with global digital networks for trade and partnerships.	+++
Environmental Monitoring	Digital tools for monitoring and managing environmental resources. Implementation of smart solutions for sustainable development.	++
Emergency Response Systems	Development of digital systems for quick response to emergencies. Implementation of technology for disaster preparedness and management.	+++
Social Innovation	Encouraging digital entrepreneurship and social innovation. Fostering a culture of technological creativity and problem-solving.	+++

Source: The table was composed by the authors referring to various relevant sources including the Ministry of Economy of the Republic of Azerbaijan and the President Administration.

Table 2 outlines the multifaceted advantages of establishing digital landscapes in Karabakh, each rated for its potential impact. With a triple plus rating, economic development opportunities include attracting digital businesses and fostering job creation. Infrastructure improvements, rated double plus, focus on enhancing digital connectivity through high-speed internet and smart city technologies. The triple-plus-rated educational opportunities involve establishing technology-focused institutions and providing access to online learning resources. Cultural preservation, tourism enhancement, and environmental monitoring, each rated double plus, emphasize the importance of leveraging digital tools to safeguard heritage, attract global tourism, and promote sustainable practices. Connectivity and collaboration receive a triple plus, emphasizing improved community communication and global integration. Emergency response systems and social innovation, both rated triple plus, underscore the critical roles of digital technologies in managing crises and fostering entrepreneurial creativity. Overall, these digital initiatives promise holistic development for Karabakh, spanning economic, educational, cultural, and environmental realms.

CONCLUSIONS

The economic rejuvenation of recently liberated areas in Azerbaijan, notably in the Karabakh region, has become a pivotal priority in the contemporary era. Over the next decade, there's a distinct emphasis on advancing construction, industry, agriculture, and the military sector to substantially contribute to the country's GDP, fostering promising economic growth. In today's landscape, a thriving economy hinges on knowledge, technological advancements, and innovative approaches. Leveraging a qualitative analysis rooted in governmental reports

and authoritative think tank papers, the study unravels the intricate web of strategies, objectives, and infrastructural developments essential for the region's advancement. The paper not only underscores the evolution from a traditional to a digital economy but also emphasizes the profound socio-economic and technological advancements poised to shape the future of Karabakh. The research distinctly fills a gap in academic literature, providing a comprehensive understanding of the economic transformation in Karabakh. By offering policy-based insights, the study stands as a cornerstone, fostering informed decision-making and strategic planning, vital for the region's revitalization. The integrative and innovative approach employed within this study propels a nuanced comprehension of the unique challenges and opportunities intrinsic to the Karabakh region's economic revitalization in the digital age.

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