1 "Smart Village" Concept in Karabagh and Eastern Zangazur Economic Regions

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Abstract: Reconstruction of the destroyed infrastructures in the liberated territories is very urgent. In the article, the ways of effective restoration of the infrastructures of those areas were investigated, the existing practices in this field were studied, and the efficiency of the proposed smart village and smart city concept for the comprehensive restoration of infrastructures was substantiated.

Keywords: Green energy, smart village, smart city, lands from occupation, Karabakh

1. Introduction

As it is known, works are being carried out in the direction of restoration and reconstruction of destroyed infrastructures in Karabakh and Eastern Zangezur economic regions.

In certain cases, the concepts called "Smart Village" and "Smart City" are used in the design of infrastructures.

Based on these concepts, the projects reflecting the modern and updated way of life envisage a number of goals: a normal, meaningful way of life, modern, scientific-based production, exemplary social services, smart and thought-out agriculture and the use of alternative energy sources. These projects include Internet of Things, Artificial Intelligence, Blockchain, etc. technologies are applied. Implementation of the "Smart Village" and "Smart City" projects is a requirement of the modern era and an indicator of development.

Certain components are formed based on the technologies used here. As an example, the electronicization and collection of electricity and water consumption can be shown in the indicated places.

The concept of "green energy" is, first of all, the way forward for Azerbaijan. This applies to the whole country and especially to the liberated territories. All freed territories of Azerbaijan constitute the "green energy zone".

Modern technologies called "smart city" and "smart village" will be used in those areas. It will also be a good example for other regions of Azerbaijan in need of reconstruction, modernization and technical progress.

In order to ensure the necessary coordination in solving these issues, it was proposed to create a working group on the concept of "Energy supply" and "Green energy zone" in the Interdepartmental Center. Currently, a working group has been formed and work has been started on the preparation of the corresponding concept document [1].

On February 22, 2021, the Ministry of Energy of the Republic of Azerbaijan and BP signed a Memorandum of Understanding on cooperation. The memorandum was signed in the context of the diversification of Azerbaijan's economy, the creation of a competitive energy market, a clean environment and a green development country, and BP's announcement of zero waste goals in 2020

According to the memorandum, it is envisaged to create a "Steering Committee" and a "Working

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Group" for the implementation of measures, and to prepare a "Master Plan" for decarbonization in the relevant regions or cities of Azerbaijan. This plan will cover clean energy projects, low-carbon transport, green buildings, waste management, clean industry, natural climate solutions, integrated partnerships, development of integrated and carbon-free energy and transport systems [2].

Effective reconstruction of destroyed infrastructures in the liberated areas depends on the projects to be applied according to appropriate concepts, taking into account the features of the place. If the destroyed infrastructures in Karabakh and Eastern Zangezur economic regions are rebuilt with the concept of "Smart Village" and "Smart City", they will meet the requirements of the era for a long time.

2. Methods

Work has already begun on the assessment of the potential of renewable energy sources in Karabakh and adjacent regions. Eight prospective areas with a total potential of more than 4000 MW for the construction of solar power plants have been identified in six districts (Fuzuli, Jabrayil, Zangilan, Gubadli, Lachin and Kalbajar) in the liberated territories of Azerbaijan.

In the mountainous part of Lachin and Kalbajar regions of Azerbaijan, there are large areas with an average annual wind speed of 7–8 m/s at a height of 100 meters. Taking into account the infrastructure, geographical topography and other factors of these areas, the initial potential of wind energy is estimated up to 500 MW [3].

Taking into account that 25% of the country's natural water resources are formed in the Karabakh region, the prospects of electricity production using the main rivers such as Tartar, Bazarchay, Hakari and their tributaries are considered. Existing hydroelectric power plants are mainly located in Tarter, Lachin and Kalbajar regions.

Preparations are already underway for the start of repair work at some small hydropower plants. The 8 megawatt Gülabird hydropower plant located on the Hekari river in Lachin district has already been put into operation.

The energy supply of the liberated territories will be provided by wind, solar and water energy sources. Creation of "green energy" zone in Karabakh will become the main source of energy supply of the region.

"Green zone" is a set of renewable energy sources. As mentioned above, exempted land has potential for all three types of renewable energy sources. Zangilan, Fuzuli and Jabrayil regions are suitable areas for using solar energy.

Foreign investors are also interested in renewable energy sources. Therefore, a number of large projects will be implemented at the expense of foreign investments in the coming years. The involvement of an international consulting company specializing in the development of a concept and master plan for the creation of a "green energy" zone in the liberated territories will ensure a more efficient organization of the work.

In Karabakh and Eastern Zangezur, when we effectively use alternative energy sources and modern technologies, including information and communication technologies, infrastructures can be organized according to the requirements of the time. Only then can minimization of risks in each field, mechanisms for making the right decisions, and effective management be achieved.

Smart cities use connected IoT devices and other new technologies to achieve goals such as improving the quality of life and achieving economic growth. The applied technologies, depending on the type of received information, can independently perform the intended operations based on a program written with a certain algorithm, or entrust the analysis of the collected data to experts for the execution of the process.

Concepts involving the integrated use of the latest technologies should be applied for more effective rehabilitation of the liberated territories.

3. Results and Discussion

Researchers offer different perspectives on the concepts of "smart city" and "smart village", on the development of cities and villages through the application of new innovative methods. In this regard, a number of articles have appeared in the scientific and contemporary literature. Different perspectives on urban and rural development through smart infrastructure, technology and communication were considered in these studies [4–15]. Some of the socio-economic changes faced by the rural and urban population in recent years can be solved more by the application of technological development and digitalization [16].

Smart village projects involve the use of new agricultural technologies. New agricultural technologies include a wide range of innovative tools aimed at increasing productivity in agriculture [17]. This includes agricultural machinery, robotics, computers, mobile devices, software, satellites, drones.

In addition, innovative technologies such as big data analytics and the use of artificial intelligence are successfully used in decision-making in agriculture. Sustainable land management can be achieved through the application of new agricultural technologies.

In general, Smart city or Smart village involves the application of the concept of Internet of Things (IoT). Continuous population growth and urbanization have an impact on the environment, citizens' lifestyles and

governance. In such a situation, there is a need to use more innovative methods in management.

Integration of information communication technologies into urban operations developed the concepts of telecommunications, information city, and digital city. The IoT concept then laid the foundation for smart cities that intelligently support city operations with minimal human interaction. The smart city has emerged to solve the problems arising from urbanization and exponential population growth [18].

However, the smart city concept is still evolving due to technological, economic and governance barriers and is not widely adopted worldwide. By considering the essence of smart cities, a brief overview of smart cities, their features and real-life applications, one can make an opinion about their capabilities and efficiency.

The term "smart village" is not new for Azerbaijan. A few years ago there was a small project in agriculture that included a Smart Village component.

The pilot project to be implemented in the First, Second and Third Agali villages of the liberated Zangilan district combines five main components and is called the foundation of the "Great Return" (Figure 1.1).

First, the way of life of these villages will be through smart technologies. Today, most people in cities, including villages, use smart technologies, artificial intelligence has already been integrated into all areas of our lives. One of the components of a smart village is the comprehensive use of these technologies in life. It covers everything from everyday smart home monitoring to smart facial recognition, security systems and electric vehicle usage [19].

The second component is social services. Two hundred houses will be built in this area, as well as modern schools, kindergartens, polyclinics and electronic management centers. All residential buildings, social facilities, administrative and public catering, processing, agriculture, production enterprises will be provided with alternative energy sources.

It is important to take advantage of the health and education systems to lead a more comfortable and enjoyable life. Because for a person to be formed, he must be healthy. This does not mean that if we apply

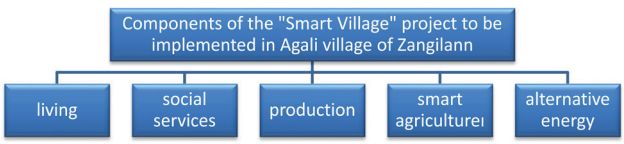

Figure 1.1. Components of the "Smart Village" project to be implemented in the First, Second and Third Agali villages of Zangilan.

Source: Author.

smart education, healthcare system, and distance education, every village will not have the traditional medical centers and school infrastructure. Of course they will. However, to make it more efficient, the said can be applied remotely to get better health and education service within a given period of time. Residents of "Smart Village" will benefit from the services of professional doctors and teachers using high-speed internet and remote services [20].

The third is the production process. There are enterprises and factories in our country that use quite advanced technologies in production. As a result of the application of these technologies in the villages, the production will be high here as well. A farmer can consume what he produces, sell it as a raw material, or sell it as a product. Using innovative technologies in the production process will produce more efficient, cheaper and export-oriented products in accordance with standards.

The fourth component is "smart agriculture", which is not new to the country. Because many farms use the "smart garden" system when growing vegetables and fruits. However, as an important component of life, the "smart village" project, as we mentioned, will be implemented from scratch for the first time in the villages of Agali 1, Agali 2 and Agali 3.

The fifth component is related to energy, because more sunny hours in Zangilan allow to use solar energy as an alternative energy source. There are also hydroelectric resources in the region.

It should be noted that the residents' issues related to technological training have been practically resolved: their knowledge and skills will be increased before they move to the village, and after returning to the village, this issue will be kept in focus. They will expand their knowledge through training.

Implementation of the "Smart City" and "Smart Village" projects is the need of the hour and an indicator of development. Representing a modern and revitalized lifestyle, these types of projects are based on a number of goals: normal, meaningful living, modern, science-based production, exemplary social services, smart and thought-out agriculture, use of alternative energy sources [21].

The President of the Republic of Azerbaijan Ilham Aliyev signed the relevant decree on the development of the concept of "Smart City" and "Smart Village" on April 19, 2021 [22].

The decree on the approval of the I State program on the Great Return to the liberated territories of the Republic of Azerbaijan was signed on November 16, 2022 [23].

Liberation of our lands from occupation is the beginning of a new era in our modern history. After that, the development and construction processes in

Azerbaijan took a new dimension. One of the priority directions at this stage is the restoration of Karabakh and Eastern Zangezur, ensuring the return of former internally displaced persons to their native lands [24].

Within the framework of the adopted Great Return program, settlements that meet the requirements of modern urban planning, new roads built at the highest level and various infrastructure facilities are being built in Karabakh and East Zangezur. In particular, infrastructure restoration works are being successfully carried out in the territory of Zangilan district. It is no coincidence that life has returned to Zangilan. The return of IDPs to the territories freed from occupation started from this district. Thus, the return of former IDPs to Agali village, which was rebuilt on the basis of the concept of "smart village" in the region last year, was ensured [25].

Today, the streets of Agalı village have achieved comfort and safety by applying "smart" lighting methods, which also allows saving. Solar panels are installed here, ecological houses are being built. The construction of a hydroelectric power station on the Hekari river is of great importance in providing the village of Agali with constant energy. Small and Medium Business Development Agency, State Agrarian Development Center, ASAN service, DOST service created in this village make access to government services even easier for residents.

The second "smart village" is Devletyarli village of Fuzuli. Currently, the construction works for coexistence in the villages that are close to each other are being continued at full speed. Initially, 450 houses will be built in the village of Devletyarli, this village is distinguished by its large size. Dovletyarli village is located near the Kondalanchay reservoir. The position of this village allows the development of fishing here. The use of water energy in the hydropower station is important in the energy supply of Agalı village. The energy supply of Dovletyarli village will be provided through solar panels that will be built on a 50-hectare area. Bash Garvand village with an area of 470 hectares of Aghdam region is planned as the next settlement within the "Smart Village" project. It is planned that 917 families will be resettled in the first phase, and 600 in the next phase [26].

In connection with the implementation of the first pilot project in Agalı village of Zangilan district within the framework of the "Great Return" program, the continuous expansion of the village, the construction of additional houses and the diversification of infrastructure projects are currently planned. Agali smart village is one of the most modern villages in the world. Zangilan has a special role in the process of turning Karabakh into a "green energy" zone. Solar energy has great potential in Zangilan.

Active work is being done in various directions in Zangilan. The Master Plan of Zangilan city has been approved, large funds have been allocated for the reconstruction of city infrastructure, and several projects are currently being implemented in this direction. It should also be noted that the construction of the Horadiz-Zangilan-Aghband railway is of great strategic importance. The construction of this railway is of great importance for both the arrival of citizens and the transportation of goods to the liberated lands. Railways and highways are also expected to pass through here. The Zangilan-Horadiz highway, distinguished by its strategic importance, will have a total length of 124 kilometers and will consist of 6 lanes. Zangilan, an important transport hub, is located on the transport corridors. Therefore, the construction of Zangilan International Airport is very important for the development of this region [27].

In total, 41 families (201 people) relocated to Agalı village, which was built according to the "smart village" concept, in the first stage, were provided with all conditions.

Residents living in Agali are provided with high-quality houses equipped with "smart" technologies. The employment, social, educational and medical issues of the population who will live here are solved by relevant institutions.

Of course, every resident of "Smart village" will be provided with a job. The creation of all guarantees here will not only make human life meaningful, but also increase the efficiency of work and services.

One of the factors evaluating the "smart village" is the "smart agriculture" aimed at the modern management and development of the agricultural sector.

Application of modern technologies, science, advanced experience in agriculture means, first of all, facilitation of manual labor, increase of productivity, increase of labor efficiency and quality, production of competitive products—improvement of people's living conditions. Undoubtedly, the conditions created in our villages will allow the creation of large farms, industrial parks, microdistricts, and the creation of conditions for the production of high-quality products.

Scientists and specialists who collect data in a single center continue experiments. In general, it is possible to group the "smart" technologies applied in the agricultural sector of the world in several directions. The most important of these is the application of a large amount of knowledge and information. The judicious use of data helps in better decision-making, leveraging existing practices and efficient productivity. Another important direction is precision agriculture. Due to the excellent control mechanism, correct decision-making is ensured. With the initial application of these two directions, productivity in certain areas of agriculture

in Azerbaijan has increased. As productivity increases, so does the demand for "smart" agriculture. New technologies are applied in the field of animal husbandry and irrigation of agricultural fields. This, in turn, leads to a reduction of costs in the agricultural sector of Azerbaijan, a more economical use of resources and an increase in productivity [28].

"Smart village" is formed in such a place where there is access to many resources, and it should be considered that this place is close to other regions and cities in terms of logistics. If so, the "Smart Village" project will step towards becoming even more successful.

In the international experience, the concept of "Smart village" is intended to create new economic opportunities in rural areas and to solve the main problems of the rural population. "Smart village" technology means digitization, thinking beyond the village environment, a new format of cooperation between the village and surrounding regions.

In "smart villages", the processes of implementation of development goals in remote areas can be observed through "smart" technology. Through this model, the efficiency and safety of social services increases, financial costs decrease, and efficient management is ensured.

As we mentioned, "Smart Village" projects are implemented in different countries of the world. The main goals in the implementation of these projects are to prevent the flow of people from the village to the city, to create an opportunity for residents to earn income in the village, and to ensure their easy access to public services.

Projects such as "Smart village" created with the support of "Vodafone" in Turkey, "Villic Kazakhstan" in Kazakhstan, "Smart village" in Rwanda, "Autonomous smart village" in Ukraine, and "Smart village" in Germany have been implemented. Smart trade and logistics, smart energy methods used in these projects have an important role.

If "smart village" technologies are applied in the territories freed from occupation, the creation of the "circle of decline" shown in Figure 1.2 can be avoided [29]:

The development and implementation of such progressive projects are directly aimed at improving the material well-being of citizens.

"Smart" technologies allow to solve problems quickly. The main goal is to achieve maximum efficiency in urban or rural management using modern technologies. That is, in real time, all information about the city or village is gathered in a certain center, and based on this information, effective measures are taken according to the requirements of the situation. This method has been on the world agenda since 2000. More and more countries are trying to use this method.

It is also clear that experts are needed for the construction of a "smart" city or village in Azerbaijan. Israeli companies have made great achievements in this field and are implementing similar projects all over the world. It is no coincidence that in 2014, Tel Aviv was awarded the title of "The Smartest City in the World".

Initiatives to roll out smart cities and villages are supported by the European Union. Countries that are part of the Association of Southeast Asian Nations, especially Singapore, are seriously interested in the concept of smart cities. In this regard, they even surpassed many Western countries.

In densely populated countries such as China and India, there is an increasing focus on smart cities based on modern technologies. Countries like USA, Canada and Australia have also achieved great success in this concept.

The world's largest companies such as "Cisco", "Schneider Electric", "IBM" and "Microsoft" are particularly active in improving the concept of "smart city".

In general, the concept of smart cities and villages is based on the realities of the modern world and allows management using modern technology. Barcelona, named the world's smartest city in 2015, hosts the annual Smart City Expo World Congress, according to the Juniper Research Center. At the event, the latest technologies of companies working on the implementation of the smart city concept are presented.

In 2001, Egypt turned to the concept of a smart village. For this, a certain area near Cairo was allocated, and in a short time the "smart village" turned into a great business center. Currently, the area has become

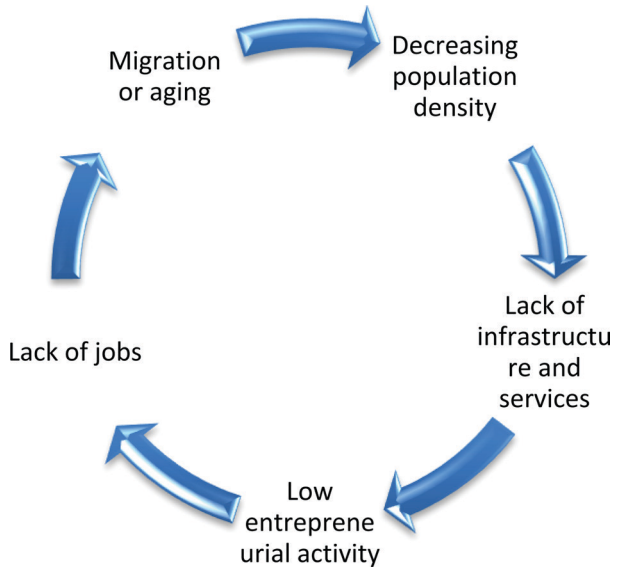

Figure 1.2. Circle of decline.

Source: Author.

so popular that many of Egypt's government institutions are now located here [21].

Experts say that there are countries where separate components of the "Smart Village" and "Smart City" projects are implemented. But there are no states that have fully formed the concept of "smart" living. Azerbaijan will test "smart" concepts based on modern innovations in the lands of Karabakh. Taking into account the efficiency of the project, it may be possible to apply it throughout the country. The use of modern technologies in production is an important factor for real food security in the world [30].

The uniqueness of the Azerbaijan model of "Smart village" is that these processes were started here at the same time, while in the world such projects have started with several examples in each country.

In general, the processes of revitalization of potential sectors such as tourism, agriculture, mining and extraction industry, production of building materials, alternative energy and integration them into the country's economy are ongoing in our territories freed from occupation. The measures to be implemented in the direction of the formation of new transport and logistics corridors in the region promise new perspectives in expanding our relations with a number of countries. The development of the agricultural sector in these regions is kept in mind in the projects implemented in the direction of the restoration of Karabakh and Eastern Zangezur. In this regard, it is planned to stimulate the activities of Karabakh farmers in the future [31].

It is important to reconstruct the district with the application of the most progressive innovations based on the modern urban planning concept, to turn it into a "green energy" zone, taking into account the availability of sufficient alternative energy sources in the freed areas. Thus, taking into account advanced international experience, the cities and villages of the region will be rebuilt on the basis of "smart-city" and "smart-rural" concepts. This, in turn, will stimulate the development of all types of tourism. In addition to the funds allocated from the state budget, increasing the role of local companies and attracting foreign investors to these processes will also contribute positively to these goals. In general, the restoration of our liberated territories based on a single concept will lead to the expansion of the country's economic potential. As the reconstruction process of Karabakh is multifaceted, new opportunities will arise for the development of many areas of the economy not only in those areas, but in the country as a whole.

The creation of new infrastructure and the implementation of business development projects in the territories freed from occupation create ample opportunities for other countries.

The infrastructure of Karabakh and Eastern Zangezur is being rapidly restored. Roads are being rebuilt here, and reliable energy and water supply is being created for liberated areas.

Until now, the implementation of a number of infrastructure projects covering various directions has been completed. These projects serve the revival of Karabakh and East Zangezur and sustainable settlement of the population. The implementation of such projects based on the concepts of "smart village" and "smart city" creates favorable conditions for the transformation of those areas into a highly developed region.

4. Conclusions

The experiences of "Smart Village" projects are constantly being studied. Based on the existing experience and new research approaches, it can be noted that considering the diversity of rural areas, smart rural development should be applied together with the approach based on the characteristics of the place. Starting the reconstruction works in the destroyed areas from scratch with the application of the latest technologies will allow efficient operation in such areas without the need for long-term improvement works, although the amount of the costs involved is high. All this suggests that it is more appropriate to apply the "Smart Village" concept in the mentioned areas.

Thus, the concept proposed to be applied in the mentioned territories of Azerbaijan freed from occupation can be considered the most effective concept, the reconstruction with the application of the latest technologies in these territories will allow for long-term operation without the need for improvement works. The reconstruction of our destroyed areas on the basis of projects based on the concept of "Smart Village" will have a positive effect on the entire region.

References

[1] Det Norske Veritas (2018). Pervoye zasedaniye mezhministerskoy Rabochey gruppy po razrabotke dolgosrochnoy energeticheskoy strategii Respubliki Azerbaydzhan [First Meeting of the Inter-Ministerial Working Group on the Development of a Long-Term Energy Strategy of the Republic of Azerbaijan], https://energycharter.org/fileadmin/ Documents Media/ EU4Energy/EU4E_Aze_EnStrat_IMWG_short_all_050718_ru_0407_fin_1.pdf

[2] Aliyeva, Z. A. (2023). Yenidənqurulan Qarabağ və Şərgi Zəngəzur Iqtisadi Rayonunda "Ağilli Kənd" (Smart Village) Konsepsiyasi. XVI International Conference of Scientific Research, 8 November 2023, p. 71–75. doi: https://doi.org/10.36719/2663-4619/2023/XVI

[3] Government of Azerbaijan. (2012). Azerbaijan Development Concept 2020: Looking to the Future [The

concept of development Azerbaijan 2020: view to the future], https://president.az/ files/future _ru.pdf.

[4] Poggi, F., Firmino, A., and Amado, M. (2015). Moving forward on sustainable energy transitions: The smart rural model. *European Journal of Sustainable Development*, *4*, 43–50.

[5] Poggi, F., Firmino, A., and Amado, M. (2017). SMART RURAL: A model for planning net-zero energy balance at municipal level. *Energy Procedia*, *122*, 56–61.

[6] Hlaváček, P., Kopáček, M., Kopáčková, L., and Hruška, V. (2023). Barriers for and standpoints of key actors in the implementation of smart village projects as a tool for the development of rural areas. *Journal of Rural Studies*, *103*, 103098.

[7] Gascó-Hernandez, M. (2018). Building a smart city: Lessons from Barcelona. *Communications of the ACM*, *61*(4), 50–58.

[8] Naldi, L., Nilsson, P., Westlund, H., and Wixe, S. (2015). What is smart rural development?. *Journal of Rural Studies*, *40*, 90–101.

[9] Orbán, A. (2017). Building smart communities in the Hungarian social economy. *Community Development Journal*, *52*(4), 668–684.

[10] Glasmeier, A., and Christopherson, S. (2015). Thinking about smart cities. *Cambridge Journal of Regions, Economy and Society*, *8*(1), 3–12.

[11] Hayat, P. (2016). Smart cities: A global perspective. *India Quarterly*, *72*(2), 177–191.

[12] Salvia, M., Cornacchia, C., Di Renzo, G. C., Braccio, G., Annunziato, M., Colangelo, A., ... Lapenna, V. (2016). Promoting smartness among local areas in a Southern Italian region: The Smart Basilicata Project. *Indoor and Built Environment*, *25*(7), 1024–1038.

[13] van Gevelt, T., Holzeis, C. C., Fennell, S., Heap, B., Holmes, J., Depret, M. H., ... Safdar, M. T. (2018). Achieving universal energy access and rural development through smart villages. *Energy for Sustainable Development*, *43*, 139–142.

[14] Bojtor, A. (2023). The use of Quality Function Deployment in case of smart village developments. In *Proceedings of the Central and Eastern European eDem and eGov Days 2023* (pp. 218–221).

[15] Tosida, E. T., Herdiyeni, Y., and Suprehatin, S. (2022). Smart village based on agriculture big data analytic: review and future research agenda. *International Journal of Agricultural and Statistical Sciences*, *18*(2), 515–538.

[16] Zavratnik, V., Kos, A., and Stojmenova Duh, E. (2018). Smart villages: Comprehensive review of initiatives and practices. *Sustainability*, *10*(7), 2559.

[17] Javaid, M., Haleem, A., Singh, R. P., and Suman, R. (2022). Enhancing smart farming through the applications of Agriculture 4.0 technologies. *International Journal of Intelligent Networks*, *3*, 150–164.

[18] Silva, B. N., Khan, M., and Han, K. (2018). Towards sustainable smart cities: A review of trends, architectures, components, and open challenges in smart cities. *Sustainable Cities and Society*, *38*, 697–713.

[19] https://azvision.az/news/261289/--agilli-kend-nece-tetbiq-olunur--5-esas-komponent--.html

[20] Kerimov, M. A., and Salmanova, F. A. (2007). Goryacheye vodosnabzheniye selskogo doma s ispolzovaniyem energii Solntsa. Teploenergeticheskiy analiz sistemy. «Novosti teplosnabzheniya». Elektronnaya versiya. http.www.rosteplo. ru/stat. 1-php2id=88 pozf110 M.

[21] https://azvision.az/news/261289/--agilli-kend-nece-tetbiq-olunur--5-esas-komponent--.html

[22] "Ağıllı şəhər" (Smart City) və "Ağıllı kənd" (Smart Village) konsepsiyasının hazırlanması haqqında Azərbaycan Respublikasi prezidentinin sərəncami. 19 aprel 2021. https://e-qanun.az/framework/47263

[23] Azərbaycan Respublikasının işğaldan azad edilmiş ərazilərinə Böyük Qayıdışa dair I Dövlət proqramı. 16 noyabr 2022. https://president.az/az/articles/view/57884

[24] Cəfərli R. Qarabağ və Şərqi Zəngəzurun bərpası inkişafın prioriteti və milli ideyadır. AR Prezidentinin İşlər İdarəsinin Prezident Kitabxanası. Azərbaycan. - 2023.- 25 oktyabr. - № 233. - S. 9 https://files.preslib.az/projects/zangilan/earticles.pdf

[25] Azadi S. Zəfərdən dirçəlişə: Zəngilan. AR Prezidentinin İşlər İdarəsinin Prezident Kitabxanası. İki sahil.- 2023.- 20 oktyabr.- № 192.