

## **REVITALIZATION OF RURAL AREAS ON REGIONAL LEVEL AS A DRIVER FOR ECOLOGICAL TRANSITION AND SUSTAINABLE DEVELOPMENT IN SERBIA**

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## **ABSTRACT**

According to the OECD criteria, more than 90% of the territory of the Republic of Serbia is defined as rural, where more than half of the total population lives. Rural areas are characterized by rich biodiversity, natural landscape and resources, and represent an important link in the food production chain. The continuous process of depopulation is recognized as one of the biggest problems, which is a consequence of economic stagnation, reduced quality of life and lack of communal infrastructure. The absence of a polycentric system of settlements, underdeveloped connections between urban and rural areas and the lack of integration of spatial and functional components in rural areas, contributed to their stagnation and marginalization. Through the analysis of the current state of rural areas in Serbia, this paper examines influence of these rural areas in process of environmental sustainability and regional development in Serbia. Starting from the assumption that rural areas have important role in regional and overall development, and considering their current state, possibilities for their revitalization were also discussed within this paper. The aim of this paper is to determine how process of revitalization of rural areas on regional level could contribute to ecological transition and sustainable development in Serbia. Revitalization of rural areas can activate natural resources and population, improve quality of life in these areas and improve spatial, social, economic and environmental structure, which affects environmental problems and foster sustainable development on a regional level.

**KEYWORDS** \_ *Environmental sustainability; Regional development; Rural areas; Natural resources*

## INTRODUCTION

Globally, rural areas represent areas that occupy a significant area, are home to a large number of the population and play an important role in the food production chain (Leuba, 2017). The state of these areas is not at an enviable level because for many years they were viewed as traditional areas that are "lagging behind" - the opposite of modern urban areas (Sorokin & Zimmerman, 1929; Bengs & Schmidt-Thomé, 2005). The degree of development and the basic characteristics of urban and rural areas differ in developed and underdeveloped countries (Tošković, 2016). Basically, these areas are characterized by rich natural resources, a significant heritage and are synonym for a healthy lifestyle and an unpolluted environment. Due to the pronounced process of depopulation, underdeveloped rural economy, which is often oriented only towards agriculture, these areas stagnate and this affects the overall sustainable development (Brauer & Dymitrow, 2014; Antić et al, 2017). Both urban and rural areas face one of the biggest global challenges of today- climate change, and its negative impact poses a threat to all structures of rural areas (Zelenakova et al, 2015). In accordance with the current trends in European countries, revitalization is recognized as one of the tools for the improvement and further sustainable development of these areas (Ringler & Meinzen-Dick, 2019; Steiner & Shenggen, 2019). Rural areas play an important role in achieving "global zero" because emissions per inhabitant in 2018 were three times higher in remote rural regions than in urban areas of OECD countries. In 2021, the OECD presented the Rural Agenda for Climate Action (2021), which defined focus areas for climate action to seize opportunities and accelerate progress towards environmentally sustainable, zero-emission economies, while overcoming the challenges that these areas face.

This paper discusses rural areas in Republic of Serbia on a regional level and their role in sustainable development. Since in the Republic of Serbia rural areas occupy a larger area than urban areas, and are home to more than half of the total population, the standpoint of this research is that these areas play an important role in the regional and overall sustainable development of the country. The goal of this research is to examine impact of revitalization of rural areas, on a regional level, on ecological transition and sustainable regional development. Existing regions are not equally developed, current state of rural areas within them is not in an enviable level and there are large differences in the level of development in economic, demographic and spatial terms. Based on all that, presumption of this research is that revitalization of rural areas can be driver for ecological transition and can contribute to more even regional development.

## METHODOLOGY

The methodological framework in this paper is based on the analysis of the current state of rural areas in Serbia and investigating possibilities for their revitalization on regional level. In the first part, the paper explores the main characteristics of rural areas in Serbia, primarily their environmental structure and its relations with other structures. Based on the results, the second part discusses the possibilities for the revitalization of these areas in the context of ecological transition and sustainable development.

In order to conduct comprehensive analysis based on all specific characteristics of rural areas, as a case study, the Region of Southern and Eastern Serbia was determined. This Region represents the most underdeveloped region in the economic terms, whose territory is characterized by rich natural resources. Also, it has the lowest number of inhabitants per km<sup>2</sup> on its territory, compared to the results of the census, the process of depopulation is pronounced and quality of life is on a very low level. Because of all that, rural areas within this Region were selected as good example for research and analysis.

## RURAL AREAS IN REGIONAL FRAMEWORKS IN SERBIA

Territory of the Republic of Serbia consists of five statistical regions which can be classified as NUTS 2 territorial level. The division into regions was created in 2010 in order to statistically divide the territory in accordance with the territorial divisions in the EU. Table 1 shows basic statistical data for each of the regions. The region of Southern and Eastern Serbia has the lowest population density, it is the most underdeveloped region in which the lowest number of people live in rural areas in the relation to the territory it occupies. Share of other- rural settlements is the highest in the Region of Southern and Eastern Serbia.

**Table 1:** Main statistical data of the regions in Serbia (Source: Statistical Office of the Republic of Serbia,2023)

Region	Total area / km <sup>2</sup> /	Settlements		Inhabitants /census 2022/		Population density in rural areas / inh/km <sup>2</sup> /
		urban	other	urban	other	
Belgrade region	3234	16	141	1383875	297530	92
Vojvodina region	21614	52	415	1075836	664394	31
Region of Šumadija and Western Serbia	26493	53	2059	911119	908199	34
Region of Southern and Eastern Serbia	26248	46	1927	749952	656098	25
Region of Kosovo and Metohija*	10910	26	1423	*514755	*1069685	*98

*\* last available census data for the Region of Kosovo and Metohija is from 1981 (Source: Statistical Office of the Republic of Serbia,2013)*

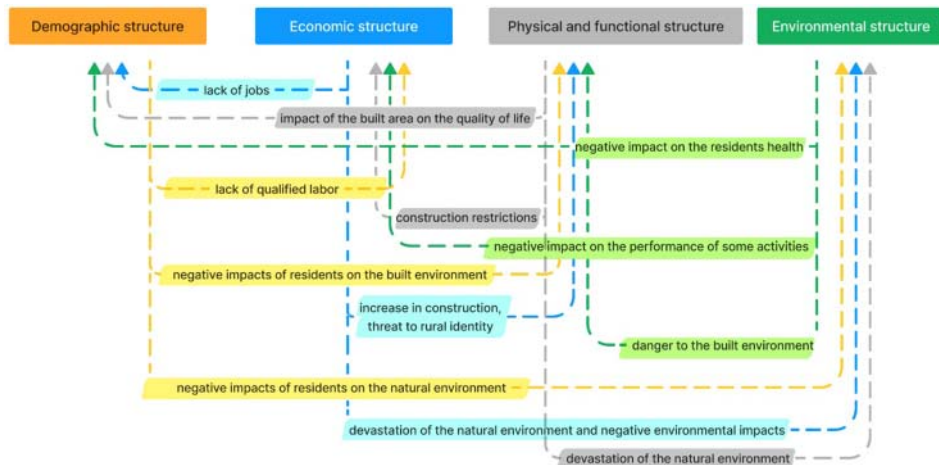
Although rural areas are located over the territory of all regions, the problems faced by these areas in the Republic of Serbia are similar. These problems are quite complex and multi-layered and they arose as a result of decades of neglect and marginalization of rural areas and the rural population. Uneven regional development and a centralized planning system also had a significant impact on the devastation and stagnation of rural areas in all regions. One of the main problems is certainly unequal economic development, due to which rural areas, especially settlements in hilly and mountainous areas, are marginalized. An underdeveloped economy affects the demographic structure, so depopulation has become increasingly pronounced in recent decades. Social exclusion is also present in the decision-making and planning processes. Because of high unemployment rate, the degree of poverty is at a high level, and income from agriculture is decreasing. This is caused due to prices on the market influenced by imports and impacts of climate changes, which have had catastrophic effects on crops in recent years. Compared to the GDP per inhabitant, the income in rural areas is evidently lower, and there is no social capital that would promote economic development and stop the trend of the "grey economy". Beside unequal economic development, these areas also face uneven spatial development and undeveloped basic communal infrastructure network. Traffic isolation is also a big problem because traffic infrastructure is not fully developed in all settlements. According to Igić et al (2017), one of the problems of rural areas is the insufficiently developed and dysfunctional network of settlements, considering the spatial and functional importance of these areas for regional development. Underdeveloped rural-urban connections represent a threat not only to more efficient rural development but also to balanced regional development. The draft of the new Spatial Plan (2021), based on the specificity of the areas, defined 6 regions of rural areas and for each of them, proposed measures for their improvement for the defined planning period until 2035.

In hilly and mountainous rural areas, there is also a very pronounced conflict over land management and protection of mountainous areas. Due to the administrative division of these areas, very often

each municipality is perceived separately through the plans, so partial assessments are made, which results in uneven and uncontrolled development of these areas. There is no adequately established balance between the protection of natural heritage and the use of natural potentials, which adversely affects the preservation of nature and the development of underdeveloped areas. Due to constant changes in the law on planning and construction, the regulation on legal-property relations is also changing, so land conversion is possible and, in some cases, protected zones become a place for construction. Illegal construction in undeveloped areas often disrupts basic water supply systems and damages natural landscapes. Inadequate waste management is also a problem in rural areas, which often results in soil contamination due to illegal dumping. Due to the traditional methods of agricultural production, land cultivation primarily, there is also an increase in harmful CO<sub>2</sub> emissions, which negatively affects the GHG effect and the environment itself.

### CONTEXT: CHARACTERISTICS OF RURAL AREAS IN THE REGION OF SOUTHERN AND EASTERN SERBIA

A healthy natural environment and natural resources are the most common associations for rural areas and represent their integral part. The greatest potential of rural areas is represented by an unpolluted natural environment, large areas under forests, fertile arable land and a built-up rural environment. Due to the marginalization and neglect of rural areas during the last decades, their greatest potentials have been degraded and disregarded, thus the development of rural areas has stagnated for years. Since this research explores impacts on ecological transition, focus will be primarily on environmental structure of rural areas. Environmental structure implies a natural environment that has a great influence on all other structures, and which represents one of the greatest potentials of rural areas. Each of the structures of rural areas – demographic, economic, spatial, functional and environmental, have impact on each other. It is important to determine these cause-and-effect relations in order to overcome all the threats and to take into account them in planning process of rural development. Figure 1 shows main mutual negative influences of the structures of rural areas in the Region of Southern and Eastern Serbia.

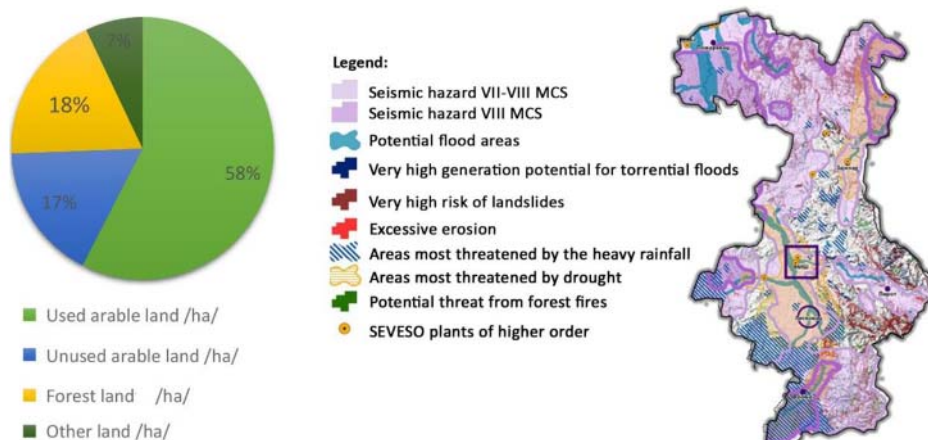


**Figure 1:** Mutual influences of problems of different structures of rural areas (Source: Authors)

Problems in the environmental structure were most often caused by the action of human factors and as a consequence of neglecting the importance of natural resources, undeveloped awareness of the rural population and inadequate implementation of legal and planning regulations in the field of environmental protection. Problems and degradation of the environmental structure have a negative

impact on the demographic structure of rural areas because they negatively affect people's health and reduce the quality of life. They affect and limit the development of some economic activities and represent a threat to built-up space, therefore they have negative impacts on economic and physical and functional structure. On the other hand, demographic structure has negative impact on environment because of the uncontrolled population activities and their low level of awareness of environment pollution. Economic structure has a negative impact on the natural environment, because due to economic activities inadequate land management occurs and damages the ecological system and biodiversity. Traditional agriculture production has impact on CO<sub>2</sub> emissions which has negative impact on environment. With uncontrolled and illegal construction, use of not eco-friendly materials and territory spreading, physical and functional structure have negative impact on environment.

The biggest problems of the environmental structure are primarily the increase in pollution of the environment and natural landscapes, the inefficient exploitation of natural resources and the increase in the negative effects of the climate change. The largest surface in rural areas are arable agricultural land and forest land (Fig. 2a). Their exploitation has been uncontrolled in recent years, leading to the devastation of agricultural land, illegal logging and destruction of forest land. Devastated arable land results in a decrease in agricultural production and yield, which negatively affects the economy. The destruction of forests leads to the destruction of ecosystems, the reduction of biodiversity and negative effects on the microclimate. On the other hand, forest areas represent one of the factors for mitigating the negative effects of climate change.



**Figure 2:** a) Structure of available land of agricultural households in rural areas in the Region of Southern and Eastern Serbia (Source: Statistical Office of the Republic of Serbia .2013. "Census of agriculture 2012") b) Segment of thematic map 19 from the Draft Spatial Plan of the Republic of Serbia for the period 2021-2035. "Vulnerability to natural disasters" - only the area of the Southern and Eastern Serbia Region is shown (Source: <https://www.mgsi.gov.rs/sites/default/files/PPRS%20Nacrt.pdf>)

According to Sekulić (2012) and Novković (2014), the most common natural hazards in the territory of the Republic of Serbia are floods, torrential floods, droughts, seismic activity, forest fires, severe soil erosion and landslides, and recently more pronounced heat waves. Figure 2b shows spatial distribution of vulnerability to natural disasters on the territory of the Region of Southern and Eastern Serbia. One of the natural resources that is most threatened in rural areas are water courses – rivers and small streams. Due to frequent periods of drought, water courses are endangered and this adversely affects a large number of rural activities – primarily agriculture and husbandry. On the other hand, due to extreme weather conditions and the torrential nature of water courses in rural areas, there are frequent occurrences of floods. they pose a threat to people's lives and health, as well as to built-up space and the rural economy. Due to inadequate maintenance and regulation of river flows, as well as due to illegal landfills along water courses, floods also occur in rural areas (Dinić Branković et al, 2020).

## REVIEW OF THE CURRENT POLICIES AND PRACTICES ON NATIONAL LEVEL AND IN EU

Rural development policy could be seen as a set of certain measures aimed at ensure the development of rural areas. In the EU, the policy framework of rural development is the Common Agricultural Policy (CAP), which has been adopted since 1962. Through Agenda 2000, rural development was determined as one of the pillars of this policy. Through its development phases, CAP has gone from a policy oriented only towards agricultural production, to a policy that deals issues of rural development and the quality of life of people engaged in agriculture. CAP 2023-27 policy is current policy, and the main goal is to become more responsible and to deal with current and future challenges that agriculture and rural areas are facing. As the most important challenges, climate change and “generation renewal” where recognized, while continuing to support agricultural producers in order to achieve a sustainable and competitive agricultural sector.

In Serbia, the current rural development policy is implemented through the Law on Agriculture and Rural Development (2016). The law defines that the agricultural and rural development policy of the Republic of Serbia is implemented through: Strategy of Agriculture and Rural Development of the Republic of Serbia (currently active for the period 2014 – 2024); National Rural Development Program (currently in the process of adoption is for the period 2022-2024) and the IPARD program for the Republic of Serbia (currently active IPARD III program for the program period 2021 – 2027).

As a part of CAP, Rural development policy is implemented through Rural development programmes (RDPs) for defined periods. Some of the examples of good practice - implemented projects from the EU are shown in table 2.

**Table 2:** Examples of good practice - implemented projects from the EU

PRIDELAVA - Increasing agricultural productivity with efficient and sustainable use of water, Slovenia Implemented 2019-2021 <a href="https://ec.europa.eu/enrd/projects-practice/eip-pro-pridelava-increasing-agricultural-productivity-efficient-and-sustainable_en.html">https://ec.europa.eu/enrd/projects-practice/eip-pro-pridelava-increasing-agricultural-productivity-efficient-and-sustainable_en.html</a>		
<b>Context- problems:</b> Lack of knowledge about water use; Only 1.3% of the total agricultural land area of Slovenia is irrigated;	<b>Goals:</b> Promotion of high productivity in agricultural production through sustainable irrigation and the reduction of water abstraction;	<b>Results:</b> Irrigation Decision Support System (IDSS); Provision of trainings in irrigation technologies; Use demonstration farms to promote IDSS;
Bonita - Introducing a new, resistant club variety of apples in Slovenia Implemented 2019-2022 <a href="https://ec.europa.eu/enrd/projects-practice/bonita-introducing-new-resistant-club-variety-apples-slovenia_en.html">https://ec.europa.eu/enrd/projects-practice/bonita-introducing-new-resistant-club-variety-apples-slovenia_en.html</a>		
<b>Context- problems:</b> Decline in apple production due to poor yields and the poor economic situation of fruit producers;	<b>Goals:</b> Improve the economic situation and competitiveness of apple producers in Slovenia; Introducing a new, resistant variety;	<b>Results:</b> New plantations of apples across 40 ha in three regions; More than 200 fruit growers participated in knowledge transfer events, workshops; The variety has achieved higher prices and brought higher incomes to its producers;
Energy transition education and animation, France Implemented 2018-2018 <a href="https://ec.europa.eu/enrd/projects-practice/energy-transition-education-and-animation_en.html">https://ec.europa.eu/enrd/projects-practice/energy-transition-education-and-animation_en.html</a>		
<b>Context- problems:</b> Low awareness of young population regarding environmental protection and renewable energy use in the context of the climate change;	<b>Goals:</b> Raise awareness among young's about energy transition and encourage them to experiment with new environmentally friendly energy practices	<b>Results:</b> Incorporating the topics of climate change and environmental protection and raise awareness among young's; Raising awareness and implementing actions regarding renewable energy use at a local level;

## POSSIBILITIES FOR REVITALIZATION OF RURAL AREAS IN THE CONTEXT OF ECOLOGICAL TRANSITION

In order to ensure the further development of rural areas, it is necessary to revitalize their existing structures, which are in poor condition. Future rural development should be based on sustainable solutions and the creation of resilient areas in the context of today's global challenges. Based on the analysis of the current state and the mutual influences of the structures of rural areas, it is important to overcome the existing problems and improve the current situation in order to ensure future development. In the following, the possibilities for the revitalization of each of the structures in the context of ecological transition and sustainable development of these areas will be discussed.

One of the biggest rural resources is the rural population. Unfortunately, there is a pronounced demographic decline in rural areas, which results in an unfavorable economic structure. In order to activate the rural community and increase its resilience, it is important to implement the process of educating its population about the possibilities of using modern technologies in all spheres of rural life - primarily in agricultural production. Also, it is essential to raise people's awareness about the importance of the natural environment and the possibilities for reducing its pollution. Since climate change is one of the biggest threats to rural development, it is obligatory to activate the local population and raise awareness about the possibilities of adaptation to it. As well, it is required to define measures and reduce negative impacts of climate change on the health and life of the rural population. By revitalizing the demographic structure of rural areas, it is possible to improve the quality of life, and environment pollution would be reduced. By applying education measures and use of modern technologies digitalization of rural population would be improved. Some of the possible activities regarding the activation of rural population are shown in a table 3.

**Table 3:** Possible activities for the activation of rural population (Source: Authors)

- |   |
|---|
| <ul style="list-style-type: none"> <li>• Lectures and workshops on the impact of climate change on rural areas and population</li> <li>• Workshops regarding identification and activation of local capacities</li> <li>• Workshops for activating and uniting the local community in order to achieve an adequate response to the impacts of climate change</li> </ul> |
|---|

In the case of the economic structure, the main economic activity in most settlements is still agricultural production, which is mainly in a traditional way without adapting to modern trends. This results in a decrease in yield and the economic unprofitability of engaging in this activity. In order to improve the economic structure and contribute to the ecological transition, it is essential to increase the climate resilience of the rural economy and reduce its negative impact on the natural environment. The use of modern technologies in agricultural production would contribute to increased yields on the one hand, and sustainable production with reduced negative impacts on the environment on the other. There are possibilities to apply agro-technological measures in order to adapt to the impacts of climate change. By diversifying the rural economy, and the agricultural activities themselves, it is possible to modernize the rural economy and promote the sustainable development of rural areas. In this way, the profitability of engaging in agricultural activities would increase. Improving the climate resilience of the rural economy would positively affect the environmental structure of rural areas and reduce the negative impacts of climate change on the economy and the negative impacts of rural activities on the natural environment. Through revitalizing economic structure, it is possible to improve the rural economy by diversifying rural activities, using modern technologies in agriculture to reduce the pollution of the natural environment and with applying adequate adaptation measures to increase the climate resilience of the rural economy. Some of the possible activities for improvement resilience of rural economy are shown in a table 4.

**Table 4:** Possible activities for improvement resilience of rural economy (Source: Authors)

- Farmers education regarding varieties that are more resistant to climate change impacts
- Development of multifunctional agricultural production within existing agricultural households
- Promotion of agroforestry and regionalization of agricultural production
- Improving agricultural production resilience through sustainable water resources management
- Climate change adaptation by using modern agrotechnical measures

One of the main characteristics of rural areas is the specific ambient identity of these areas, which consists of an unpolluted environment and traditional architecture. As a result of the demographic emptying, buildings are being abandoned and remain empty, and as a result of illegal construction, the territory of rural settlements is expanding at the expense of arable and forest land. In order to increase the resilience of the built-up rural area and reduce the conversion of agricultural land into construction land, it is necessary to digitize rural areas, improve the existing planning system and introduce control over the expansion of the territory. In addition to agriculture, housing is the main function in rural settlements. Houses in rural settlements were built with traditional materials without the application of energy efficiency measures. By energy renovation of buildings and definition of closer regulation of construction rules, it is possible to improve housing in rural areas in the context of climate change (Igić et al, 2021). Resilience of the open spaces in rural areas can be also improved by applying some of the sustainable contemporary urban and architectural concepts. One of the possibilities is using Nature Based Solutions in order to reduce negative impacts caused by the climate change (Igić et al, 2020). Revitalizing the spatial structure, it is possible to increase the resilience of built space, reduce environmental pollution and improve the quality of rural housing in the context of energy efficiency and global challenges. Some of the possible activities for increasing resilience of spatial structure of rural areas are shown in table 5.

**Table 5:** Possible activities for increasing resilience of spatial structure in rural areas (Source: Authors)

- Defining adaptation measures for residential buildings to the effects of climate change according to the estimated existing risks
- Assessment of the vulnerability of open public spaces to weather extremes
- Subsidies for the application of contemporary concepts when renovating of buildings
- Application of contemporary urban planning concepts within planning documents

One of the greatest potentials of rural areas are natural resources and the natural environment, however, due to their inadequate management and exploitation, as well as due to the impact of climate change, they are endangered. Sustainable management of natural resources refers to the improvement of the environmental structure, which would have a positive impact on all other structures of rural areas. In order to protect land and water resources, it is necessary to establish mechanisms for their sustainable and responsible management in rural areas. Climate changes have a great impact on the environmental structure, so it is important to develop mechanisms for risk management, warning and protection from natural hazards. Climate change is a global threat, so it is mandatory to increase resilience of the community, built space and natural environment. Revitalization of environmental structure and environmental protection are prerequisites for increasing the quality of life in rural areas, improving the health of residents and the sustainability of the spatial and physical structure, and improving the quality of food production. Some of the possible activities for improvement of environmental structure are shown within table 6.



**Table 6:** Possible activities for improvement of environmental structure (Source: Authors)

- Special rules for planning and construction in the context of environmental protection in rural settlements
- Planners' education regarding possibilities of use contemporary concepts in climate change adaptation
- Development of an early warning system for extreme weather events and their consequences
- Cultivation of suitable varieties in the context of the sustainable management of water resources on rural area

## CONCLUSIONS

The conducted analysis concluded, that for the development of rural areas, it is important first of all to carry out process of their revitalization, in order to restore and improve the existing situation. Also, it was concluded that problems exist within all structures of rural areas, and that the problem of one structure negatively affects the development of other structures. Because of that, it is necessary to apply a comprehensive - multi-sector approach during the revitalization process in order to more effectively overcome all problems. Disruption of the ecological balance, environmental pollution and the effects of climate change negatively affect the revitalization process of rural areas, and rural development in general. Because of all this, it is necessary that the concept of sustainable development, protection of undeveloped areas and the natural environment, in addition to the protection of natural heritage and resources, must take into account specificities of each area at the local and not the national or regional level.

In order to take into account all the individual specificities of rural areas, their development should be planned on smaller territorial units. In this way, it is possible to adequately apply a comprehensive approach and activate all potential resources. In this research, rural areas were analyzed at the regional level. Based on the analysis, it was concluded that each of the structures of rural areas has an impact on their overall sustainable development. Rural population and natural environment are recognized as the greatest resources of rural areas, and at the same time their comparative advantage. With their activation and better exploitation, it is possible to promote the further development of rural areas and contribute to the ecological transition. Rural areas face a large number of problems that can be overcome through the process of revitalization and contribute to sustainable and ecological development, increase the resilience of all structures of rural areas, adequately respond to all global challenges of today and improve the process of digitization of rural areas.

Overall, it can be concluded that rural areas have important role in sustainable development on both national and regional level. Revitalization of these areas undoubtedly has positive impact on quality of life, rural economy, built area and natural resources. According to the results of this research it is concluded that revitalization process of rural areas can be considered as a driver for ecological transition and can contribute to further development.

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