

THE CONCEPT OF BIO-REGIONS AND ITS RELEVANCE IN ACHIEVING GREEN GOALS

Liga Proskina¹, Dr.oec.; Abduaziz Abduvasikov², PhD.; Firuza Galimova³, PhD.;
Daniela Proskina⁴, Mg.oec.

^{1,4}Latvia University of Life Sciences and Technologies, Latvia; ^{2,3}Tashkent State Agrarian University, Uzbekistan

Abstract. Various initiatives worldwide promote sustainable, locally-based food systems and rural development, including Community Supported Agriculture (CSA), Farmers Markets, Food Hubs, Slow Food Movement, Regenerative Agriculture, and Agroecology Networks. These approaches often address specific challenges within narrower contexts. The concept of bio-regions offers a holistic approach to sustainable development, integrating ecological, social, economic, and cultural dimensions, demonstrating promising socio-economic and environmental impacts, and fostering community engagement and local development. Examples of good practices of bio-regions in European countries allow us to evaluate the relevance and possibility of application of this concept in Uzbekistan, as a strategy to promote sustainable development and resilience at the local and regional level. In the context of Uzbekistan, bio-regions can play a crucial role in achieving the country's green goals by addressing various environmental and socio-economic challenges while fostering sustainable development. By addressing these actualities and research on bio-region impact on local development in EU countries, researchers can contribute to advancing knowledge on community resilience and social cohesion in rural areas of Uzbekistan within the context of bio-regions. This can inform evidence-based policies, programmes, and interventions aimed at promoting sustainable development, environmental conservation, and social well-being in rural communities. The present research aims to investigate the theoretical and policy frameworks for the concept of bio-regions in the EU, which could be applied in achieving sustainability goals and solving environmental and socio-economic problems in Uzbekistan. Although there is no bio-regional policy in Uzbekistan, existing policy documents related to sustainable development, environmental conservation and rural development provide a basis for integrating bio-regional approaches into national strategies.

Key words: bio-region, rural development, organic farming.

JEL code: R58, Q38

Introduction

The environmental impacts of food consumption, particularly concerning greenhouse gas emissions, are increasingly recognised as a critical concern for sustainability (Parente et al., 2018). Globally, society's quality of life depends on the planet's resources and biodiversity. Based on this assumption, it is possible to look at the economy as a part of society, while society is part of the planet's biosphere. Unfortunately, very often society sees itself as part of the economic system, leaving the environment a completely insignificant role. An ecologically sustainable future can be ensured in an economic system where the economy is a part of the environmental system. Sustainable management of the environment is possible when problems are addressed in an interdisciplinary manner. It is necessary to find solutions, to nationally strengthen small and medium-sized enterprises, purposefully creating tools, which would contribute to the sustainable development of the territories.

One of the areas of sustainable agriculture is organic farming. In 2022, there was a substantial expansion in the global organic farming sector, with the cultivated area experiencing a growth of more than 20 million hectares, culminating in a total of 96 million hectares worldwide, representing an increase of 26.6 percent or 20.3 million hectares compared with 2021. The global organic market reached nearly 135 billion euros (IFOAM, 2024). By adopting environmentally friendly farming practices, farmers can reduce their ecological footprint, mitigate climate change, protect natural resources, and contribute to the long-term sustainability of agricultural systems while maintaining productivity and profitability. It includes several key principles (Stotten, Froning, 2023). Environmental sustainability: these food systems prioritise

¹ E-mail: Liga.proskina@lbtu.lv

practices that conserve natural resources, minimise pollution, and promote biodiversity. Social equity and inclusivity: sustainable, resilient, and inclusive food systems aim to address issues of food insecurity, poverty, and inequality (Paula, Kaufmane, 2020). Economic viability: these food systems promote fair and equitable economic relationships throughout the food supply chain. Resilience and adaptation: sustainable, resilient, and inclusive food systems are designed to withstand and recover from shocks and stresses, such as extreme weather events, crop failures, and economic downturns. They promote diversification in food production and distribution systems, as well as the adoption of climate-smart agricultural practices that enhance resilience to changing environmental conditions (Douwe van der Ploeg et al., 2019).

There are numerous initiatives worldwide aimed at promoting sustainable and locally-based food systems while fostering community engagement and environmental stewardship. These initiatives vary in scale, scope, and approach but share common goals of promoting ecological sustainability, supporting local economies, and empowering communities. The most significant is as follows: *Community Supported Agriculture (CSA)* initiatives connect consumers directly with local farmers, allowing individuals to purchase seasonal produce directly from the farm. By fostering relationships between farmers and consumers, CSA promotes transparency, trust, and mutual support within the local food system (Egli et al. 2023). *Farmers markets* provide a platform for local farmers, artisans, and food producers to sell their products directly to consumers. These markets often prioritize locally grown, seasonal, and organic foods, thereby promoting sustainable agriculture, supporting small-scale producers, and reducing food miles. *Food hubs* are centralized facilities that aggregate, process, and distribute locally sourced food to consumers, institutions, and businesses. Food hubs play a critical role in connecting small-scale producers with larger markets, increasing access to local foods, and promoting regional food economies. *The Slow Food movement* advocates for a food system that is good, clean, and fair for all. Slow Food initiatives promote local food cultures, traditional culinary practices, and biodiversity conservation, while also advocating for social justice, food sovereignty, and environmental sustainability (Kinley, 2012; Askin, 2021). *Regenerative agriculture* focuses on improving soil health, enhancing ecosystem services, and sequestering carbon through farming practices such as no-till farming, cover cropping, and rotational grazing. These approaches promote ecological resilience, mitigate climate change, and restore degraded landscapes. *Agroecology networks* bring together farmers, researchers, activists, and policymakers to promote agroecological principles and practices. These networks advocate for policies that support agroecology, provide technical assistance to farmers, and facilitate knowledge sharing and capacity building. However, each of these approaches is focused on a narrower set of problem solutions (Zanasi et al., 2020; Stotten et al., 2017). A bio-region initiative, sometimes referred to as a bio-regional development initiative or bio-district initiative (or Organic District or Bio District or Eco Region), is a community-based effort aimed at promoting sustainable development and resilience within a specific geographic area, typically defined by ecological and cultural boundaries rather than political or administrative ones (Dias et al., 2021). In general, the bio-region concept is based on the combination of the culture in a region with focus on organic farming and highlighting its considerable potential for fostering sustainable territorial development (Pugliese and Antonelli, 2015). To sum up, the experience of European countries in fostering organic farming by developing a strategy for bioregions at the regional level shows how environmental protection, social justice and cultural preservation can be combined for sustainable and professional food production.

In this context, Uzbekistan with its rich agricultural heritage and potential seeks best practices applied in European countries to adapt and successfully apply them in achieving the country's green goals. In the Republic of Uzbekistan, just like in many other countries, the development of organic farming has become

one of the important strategic priorities that can contribute to the sustainable development of the rural sector and the creation of the "green" future of mankind. It should be noted that the EU-Uzbekistan Cooperation Council appreciate the growing cooperation between Uzbekistan and the EU, including that in the green and sustainable economy (EU-Uzbekistan Cooperation Council, 2021). Therefore, the authors believe that the experience of European countries in using the concept of bioregions can make a positive contribution to agricultural and rural development, environmental sustainability and the socio-economic development of Uzbekistan. The present research aims to investigate the theoretical and policy frameworks for the concept of bio-regions in the EU, which could be applied in achieving sustainability goals and solving environmental and socio-economic problems in Uzbekistan.

Materials and methods

The monographic method, analysis and synthesis, and induction and deduction methods were applied to discuss the theoretical and controversial aspects within the context of research aim. The paper encompasses a comprehensive description of the bio-region concept and the corresponding policy framework in Europe and presents the analysis of the relevance of the bio-region concept in achieving "green" objectives in Uzbekistan.

Research results and discussion

1. Characteristics of the bio-region concept in Europe

By integrating ecological, social, economic, and cultural dimensions, bio-regions offer a holistic approach to sustainable development that prioritizes the well-being of both people and the planet (Oliver, 2019). The objectives of the bio-regions can be grouped in three main areas: 1) economic; 2) environmental and 3) social. Accordingly, to achieve the goals of the bio-region, initiatives are focused on (Report on Organic..., 2021): *Local Resource Management*. Bio-region initiatives prioritize the sustainable management of natural resources within the region, including land, water, forests, and biodiversity. This may involve promoting practices such as organic farming, agroforestry, watershed management, and habitat restoration to enhance ecosystem health and resilience. *Environmental Education*. Bio-regions provide opportunities for environmental education, awareness-raising, and capacity-building within local communities. This includes promoting ecological literacy, fostering a deeper understanding of local ecosystems, and empowering residents to become stewards of their environment. *Local Food Systems*. Bio-region initiatives often focus on developing local food systems that prioritize food security, nutrition, and community resilience. This may involve supporting small-scale farmers, promoting agroecological practices, and creating networks for local food production, distribution, and consumption. *Community Engagement*. Bio-region initiatives actively engage local communities in decision-making processes related to environmental stewardship, economic development, and social equity. This may include participatory planning, community-based research, and collaborative partnerships among stakeholders from diverse backgrounds (Zeverte-Rivza et al., 2023). *Regional Cooperation*. Bio-regions encourage collaboration and cooperation among diverse stakeholders, including government agencies, NGOs, businesses, and community organizations. By working together, these stakeholders can leverage resources, share knowledge, and implement collective actions to address common challenges and achieve shared goals (Chatzichristos et al. 2021). *Economic Development*. Bio-region initiatives aim to foster economic development that is ecologically sustainable, socially equitable, and culturally appropriate. This may involve supporting local businesses, cooperatives, and social enterprises that prioritize environmental stewardship and community well-being. *Cultural Preservation*. Bio-region initiatives recognize the importance of cultural heritage and

traditional knowledge in shaping sustainable futures. This may involve efforts to preserve indigenous cultures, promote local arts and crafts, and celebrate cultural diversity as integral components of bio-regional identity. *Regional identity*. BioRegion promotes regional identity (The role of local..., 2020). It creates openness to new things and future developments. Member companies also raise awareness through their products from the BioRegion by increasing the number of products through cooperation between agriculture and trade (Guareschi et al., 2020).

The experience of Bio-districts in Italy (The experience of..., 2017) indicates promising prospects, with a noticeable increase in active participants and demand for organic products. The shortening of the supply chain has led to loyal customers and boosted development in the sector, with more farms transitioning to organic production. Farmers are recognized as essential ecosystem managers, enhancing their social role and identity. The bio-district has empowered rural communities in their interactions with local authorities through consultations and participatory planning. Additionally, associations, cooperatives, and academia provide platforms for knowledge sharing and support. The Cilento bio-district leverages its short value chain as a key strength, with 75% of economic flow stemming from direct marketing channels like on-farm sales, farmer's markets, and e-commerce platforms. Public procurement, restaurants, and tourist facilities contribute 15%, while traditional distribution and exports make up the remaining 10%. Local consumption and the tourist sector absorb the majority of production. Associations within the bio-district play a crucial role in facilitating economic relationships, providing assistance to farmers, and promoting sustainable production and local purchasing. This collaborative approach ensures the active involvement of various consumer types in enhancing products, services, and production processes (The role of local..., 2020).

The Bio-district Cilento serves as a bottom-up organizational innovation, fostering multi-level territorial governance and mobilizing political actors, public institutions, and civil society to harness the area's heritage for innovation and rural development (Dias et al., 2021). Initiatives such as the document "Costruire una strategia condivisa di sviluppo dei territori" and the "La carta di Padula" Agreement demonstrate a commitment to agroecology and organic farming within Italy's parks and protected areas. The success of Cilento has catalyzed the establishment of numerous bio-districts across Italy, Europe, and Africa, with ongoing efforts to promote legislative support and international cooperation through platforms like the International Network of Eco Regions (IN.N.E.R). These initiatives aim to strengthen governance, promote sustainable agriculture, and address global agricultural challenges through collaboration and knowledge exchange (Pugliese, Antonelli, 2015).

The implementation of bio-regional approaches in the European Union (EU) countries has evolved over several decades, with roots in various environmental and sustainability movements to mainstream policies and strategies for sustainable development (Heimann, 2019).

The concept of sustainable development gained prominence in EU policy discourse in the 1990s. The Rio Earth Summit in 1992 and the subsequent adoption of Agenda 21 encouraged the EU countries to integrate environmental, social, and economic considerations into their development strategies. This period saw the emergence of initiatives promoting regional self-sufficiency, local food systems, and eco-communities, laying the foundation for bio-regional approaches.

In the early 2000s, EU countries began mainstreaming sustainability policies into national and regional planning frameworks. The European Commission's adoption of the Lisbon Strategy in 2000, followed by the Europe 2020 Strategy in 2010, emphasized the importance of promoting smart, sustainable, and inclusive growth. This period witnessed increasing recognition of bio-regional concepts in EU policy documents and research agendas. During the next decade a proliferation of regional initiatives and projects promote bio-regional approaches across EU countries. EU-funded programmes such as INTERREG and LEADER also

supported bio-regional development projects at the regional and local levels (Bosworth et al., 2016). The European Green Deal, launched in 2019 (The European Green deal, 2019), aims to make the EU's economy sustainable and climate-neutral by 2050. Bio-regional approaches, including initiatives promoting circular economy, renewable energy, and regenerative agriculture, are increasingly recognized as integral to achieving the goals of the European Green Deal (Tetere et al., 2023). While there isn't a specific legal framework or regulatory system at the European Union level that directly governs bio-regions, EU policies and initiatives provide a supportive framework for promoting sustainable development, rural revitalization, and environmental conservation, which are central to the objectives of bio-regional initiatives (A long-term Vision ..., 2021).

The Common Agricultural Policy (CAP) sets out the agricultural policy framework for the EU and provides financial support for farmers and rural development and is not specifically targeted to bio-regions, nevertheless includes measures that promote sustainable agriculture, rural development, and environmental conservation, which are relevant to bio-regional initiatives (Key policy objectives..., 2023).

European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI): EIP-AGRI is an EU initiative that promotes innovation in agriculture and forestry to improve productivity and sustainability. It supports networking and knowledge exchange among stakeholders, which can facilitate the exchange of best practices and ideas relevant to bio-regional development. European Regional Development Fund (ERDF) and Cohesion Policy: These EU funding programmes support economic and social cohesion across the EU regions. While not specifically focused on bio-regions, they can provide funding for projects that contribute to sustainable development, innovation, and job creation in rural areas, which are often key components of bio-regional initiatives. Natura 2000 is a network of protected areas established under EU law to conserve biodiversity and protect habitats and species of European significance. While not specifically related to bio-regions, Natura 2000 sites can overlap with bio-regional boundaries and contribute to the conservation of natural resources and ecosystems (EU funding programmes, 2023).

2. Relevance of the bio-regional concept in achieving Uzbekistan's green goals

Being aware of the scale of environmental problems in the world, the Uzbek government prioritizes an increase in the efficiency of the agricultural sector and a reduction in the impact on the environment and natural resources. In this context, the development of organic farming and the promotion of environmentally friendly sustainable production systems is an essential factor in increasing the competitiveness of food products and developing the export potential. Uzbekistan's efforts in the field of organic farming are also appreciated internationally (FAO, 2018) However, despite the steady growth of organic farming in recent years (Table 1), Uzbekistan is at the early stages of organic farming development.

Table 1

Main indicators of agriculture sectors in Uzbekistan, 2016-2021

Agriculture	2016	2017	2019	2020	2021
Total number of enterprises, units, inter alia*	4 626070	4 669263	4 707873	4 736957	4 692554
Micro-size (dekhkan farms)	4 525000	4 535000	4 560040	4 585000	4 600000
Small-size	x	x	x	x	x
Medium-size (farms)	101 070	134 263	147 833	151 957	92 554
Large-size (organizations engaged in agricultural activities)	17 621	18 319	21 019	24 480	29 379
Total output in agriculture, in billion EUR	14.5	15.1	13.7	17.7	18.4
Output in crop production (in billion EUR)	8.0	7.9	7.5	9.1	9.3
Output in livestock production (in billion EUR)	6.4	7.2	6.1	8.6	9.1
Cattle as the main species of livestock (thou. heads)	11 641	12 181	12 471	12 814	12 950
Cows as the main species of livestock (thou. heads)	4 174	4 217	4 337	4 626	4 664
Sheep and goats as the main species of livestock (thou. heads)	19 119	19 698	20 641	21 581	21 907
Poultry as the main species of livestock (thousand heads)	61 349	67 038	74 870	86 375	87 860
Meat (in billion EUR)	4.1	4.7	4.1	5.9	5.9
Milk (in billion EUR)	2.0	2.1	1.7	2.3	2.8
Eggs (in billion EUR)	0.2	0.3	0.2	0.3	0.3
Total import of agricultural produce, in billion EUR	0.4	0.4	0.4	0.5	0.7
Total export of agricultural produce, thou. in EUR	1.5	1.0	0.9	0.8	1.1
Utilized agricultural area (UAA), thou. ha	25 366	25 344	25 280	25 259	25 252
Utilized agricultural area (UAA) as % of total country's area	57	57	57	57	57
Number of farms engaged in organic farming, units	2 054	2 713	3 392	4 198	4 628
Utilised agricultural area (UAA) in organic farming, thou. ha	6.0	-	-	-	17.2

* *In the statistics of Uzbekistan, agricultural production enterprises are divided into: a) Large-scale enterprises engaged into agricultural production: joint-stock companies, cooperatives, agro-clusters, state-owned farms; b) Farms (medium-size) are private commodity producers with a long-term lease of land from the state (they have different production volumes, which depend on their specialization); c) Dekhkan (household or subsistence) farms (micro-size) are private farms of the population that produce agricultural products on personal land plots with or without the formation of a legal entity; d) Small-size – small business entities include: Microenterprises with an average annual number of employees involved in the manufacturing industries of no more than twenty people, in the service sector and other non-manufacturing industries – of no more than ten people, and in wholesale, retail and catering – of no more than five people; Small enterprises with an average annual number of employees involved in production and processing of agricultural products – no more than fifty people.*
 Source: *Statistics Agency of Uzbekistan, 2023*

Organic farming is recognized as a promising type of farming for dekhkan (micro-size) farms representing the absolute majority of agricultural enterprises (Table 1) in Uzbekistan, as well as small farms and other economic operators in agriculture. The fast and efficient development of organic practices in agriculture, forestry and fisheries requires significant investments and scientific research to remove barriers to more intensive growth in organic farming and to increase the engagement of all actors in the market of organic products. On the one hand, it relates to the development and introduction of new scientifically based organic technologies; on the other hand, the need for a supportive government policy

and a clear strategic vision for organic farming, considering the economic, environmental and social components of it, cannot be denied.

One of the strategies contributing to the development of organic farming is the bio-regional approach, which can be highly relevant and beneficial for Uzbekistan. Uzbekistan, like many other countries, may not have specific policies or legal initiatives explicitly labelled as "bio-regional policies." However, the country has several broader policies and legal frameworks that address organic farming development, environmental conservation, sustainable development, and rural revitalization, which align with the objectives and principles of bio-regional initiatives as well as international agreements that encompass elements relevant to bio-regional initiatives and sustainable development in the region. These policies often focus on environmental conservation, sustainable agriculture, water resource management, and regional cooperation.

It is important to emphasize that bio-regional initiatives offer a holistic approach to sustainable development that is well-suited to the ecological, cultural, and socioeconomic context of Uzbekistan. One of the primary benefits of the bio-region concept is its focus on organic production in the agriculture sector that include ecosystem conservation and biodiversity preservation as well.

Central Asian countries, incl. Uzbekistan, are signatories to international agreements and initiatives addressing environmental sustainability, such as the United Nations Sustainable Development Goals (SDGs) and the Convention on Biological Diversity (CBD). These agreements provide overarching frameworks for promoting biodiversity conservation, sustainable agriculture, and inclusive development, which are central to the objectives of bio-regional initiatives. The Framework Convention for the Protection of the Environment for Sustainable Development in Central Asia (The Framework Convention..., 2006) focuses on transboundary water management, biodiversity conservation, and environmental governance in the region.

By prioritizing the protection of natural habitats, wildlife, and critical ecosystems, bio-regions contribute to maintaining ecological balance and resilience. This leads to benefits such as improved water quality, enhanced soil fertility, and increased carbon sequestration, which are vital for sustaining healthy ecosystems and supporting diverse forms of life.

Another key benefit of the bio-region concept is its emphasis on building community resilience and social cohesion. Bio-regions foster strong connections among local residents, businesses, and institutions, creating a sense of shared purpose and collective responsibility for environmental stewardship. Through collaborative efforts, knowledge sharing, and mutual support networks, bio-regions empower communities to address challenges such as climate change, food security, and economic volatility, leading to greater resilience and well-being for residents.

Uzbekistan is characterized by diverse ecosystems, rich biodiversity, and unique cultural heritage, making it an ideal region for implementing bio-regional approaches to sustainable development. By integrating environmental conservation, community empowerment, and regional cooperation, bio-regional initiatives can contribute to a more resilient and prosperous future for the region. It includes community empowerment, regional cooperation, biodiversity conservation and sustainable agriculture.

Uzbekistan has developed national strategies and plans for sustainable development, which include objectives related to environmental protection, biodiversity conservation, and rural development. These strategies may provide a basis for promoting bio-regional approaches to sustainable development within the country (Development Strategy of ..., 2022).

Community Empowerment. Rural communities in Uzbekistan have rich cultural heritage and traditional knowledge systems that are closely linked to their environment and way of life. Examining how cultural

identity contributes to community resilience and social cohesion within bio-regions can provide insights into the importance of cultural preservation and indigenous wisdom in sustainable development. The permanent population of the country amounted to 33,375.8 thousand people, the urban population amounted to 16,865.1 thousand people (50.5 % of the total population) and the rural population amounted to 16,510.7 thousand people (49.5%) (Statistics Agency, 2023). Bio-regional initiatives can build on these strengths by empowering local communities to participate in decision-making processes related to land use, natural resource management, and sustainable development. This can help foster a sense of ownership and stewardship among local residents, leading to more effective and sustainable outcomes. The Decree of the President of the Republic of Uzbekistan *Regarding the measures to radically update the state policy in the economic development and poverty reduction 2020–2030* (Collection of legislation..., 2023) is aimed to reducing poverty can only be solved through the parallel development of all areas of human life, including meeting minimum needs for food, drink, housing and human empowerment through increased access to education, health care and professional and creative development. In Uzbekistan, the strategically important and consistently solvable task is to improve the well-being of the population. However, in recent years the fight against poverty has been consistently implemented in the state economic policy and is included in the national goal, which is taken into account in the development and implementation of Uzbekistan's strategic programmes and development plans. *Regional Cooperation*. Central Asia is a region of diverse ethnicities, languages, and political boundaries. Bio-regional initiatives can serve as platforms for fostering regional cooperation and dialogue on shared environmental challenges, such as water management, biodiversity conservation, and climate change adaptation. By promoting collaboration among neighbouring countries, bio-regional initiatives can help build trust, enhance resilience, and create opportunities for mutual benefit.

Biodiversity Conservation. However, rural areas of Uzbekistan face environmental challenges such as water scarcity, soil degradation, and climate change impacts. Understanding how these vulnerabilities affect community resilience within the bio-region context is crucial for developing effective adaptation strategies and sustainable land management practices. Bio-regional initiatives can help conserve this rich biodiversity by promoting sustainable land use practices, habitat restoration, and wildlife conservation efforts tailored to the specific ecological characteristics of each bio-region (Strategy for Biodiversity..., 2019). *Water Resource Management*. Water is a critical resource in Central Asia, where major rivers such as the Amu Darya and Syr Darya are vital for agriculture, industry, and human consumption. Bio-regional initiatives can focus on integrated water resource management, including watershed protection, water conservation, and water-efficient farming practices such as drip irrigation, rainwater harvesting, and mulching to help conserve water resources and improve water-use efficiency in agriculture. Uzbekistan has undergone legislative reform improving existing ecology and environmental protection legislation that meets world standards. An important step in improving the organisational structure of environmental activity is the Law on Environmental Control of the Republic of Uzbekistan, which provides a legal basis for active participation of all civil society institutions in the environmental protection system and the process of solving environmental problems.

Sustainable Agriculture. Uzbekistan's agricultural policies aim to promote modernization, diversification, and sustainability in the agricultural sector. These policies may include measures to support sustainable farming practices, agroecology, and rural development, which can contribute to the goals of bio-regional initiatives focused on sustainable agriculture and food systems. Agriculture is a key economic sector in Uzbekistan, providing livelihoods for millions of people. Agriculture is one of the dominating sectors of the Uzbekistan's economy and developing intensively. In 2020, agriculture accounted for 28.2 % of GDP and

26.8 % of employment. About 16 million tons of fruit and vegetable products are produced in Uzbekistan every year, the country has formed substantial stocks of grain and food essentials – meat, vegetable oil, sugar and rice (Agriculture Sector in ..., 2022). Bio-regional initiatives can promote sustainable agriculture practices that enhance soil fertility, conserve water, and minimize the use of agrochemicals. This may include organic farming, crop diversification, and the use of traditional farming techniques adapted to local conditions. One of the priority directions of the Strategy of Actions for the Further Development of the Republic of Uzbekistan adopted at the beginning of 2017 is the modernisation and intensive development of agriculture. On October 23, 2019 the *Strategy for the Development of Agriculture* of the Republic of Uzbekistan for 2020-2030 was approved (Agriculture development strategy ..., 2019). Priority directions for the implementation of the Strategy are fulfilment of the state policy on food security, providing for food safety and improvement of the consumer intake, production of food products in the required quantity; creation of a favourable agribusiness climate and value-added chain, production of agro-food products with high added value competitive on target international markets; introduction of mechanisms to reduce the role of the state and increase the investment attractiveness of the industry. *Uzbekistan's Agri-food Development Strategy 2020-2030* (Agrifood sector trends..., 2023) aims to diversify production, improve land and water relations, create a favourable agribusiness climate and high-value chain, support the development of cooperative relations, broad implementation of market mechanisms and information and communication solutions into the industry, as well as effective use of scientific advances and increase human resources in the agricultural sector. As a result, it is expected to achieve job growth, food security and security of the country's population, as well as to increase farm incomes and ensure sustainable use of natural resources.

Uzbekistan has implemented community-based development programmes and initiatives aimed at empowering local communities, supporting small-scale agriculture, and promoting sustainable natural resource management. These initiatives may provide opportunities for integrating bio-regional approaches to development at the grassroots level. While Uzbekistan do not have specific policies or legal initiatives labelled as "bio-regional policies," the country's existing policy frameworks and legal instruments provide a basis for advancing sustainable development and environmental conservation efforts that align with the principles of bio-regional initiatives. By integrating environmental conservation, community empowerment, and regional cooperation, bio-regions can help the country achieve its green goals while promoting resilience, prosperity, and well-being for current and future generations in Uzbekistan.

Conclusions, proposals, recommendations

- 1) The bio-region approach, using the principles of agroecology, is aimed at promoting the local economy and sustainable agriculture, developing the rural environment in a specific geographical area, protection of natural resources and biological diversity, preservation of scenic values, and preserving the quality of the cultural environment.
- 2) Uzbekistan has strategies and policies related to environmental, social, and economic development. They are similar to and different from the EU strategies and policies, and national strategies and policies of the EU countries as well.
- 3) By integrating bio-regional approaches into national policies and programmes, Uzbekistan can promote holistic and locally appropriate solutions to environmental, social, and economic challenges in the country.

Acknowledgement

The research received funding from the fundamental and applied research project No. lzp-2022/1-0519 "Bio-Regions as an Integrated Strategy for the Sustainable Development of Rural Territories in Latvia.

Bibliography

1. Agrifood sector trends and reform progress. (2023). "Agrosanoatni raqamlashtirish markazi" GY. Retrieved from <https://2030.serio.uz/en/>
2. A long-term vision for rural areas. (2021.) European Commission communication. Retrieved from: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698027/EPRS_BRI\(2021\)698027_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698027/EPRS_BRI(2021)698027_EN.pdf)
3. Agriculture Development Strategy of Uzbekistan for 2020-2030. (2019). Presidential Decree No. UP-5853 validating Agriculture Development Strategy of Uzbekistan for 2020-2030. Retrieved from: <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC197241/>
4. Agriculture Sector in Uzbekistan and Karakalpakstan. (2022). Legal & Political Framework Review. Global Green Growth Institute, Tashkent, Uzbekistan. Retrieved from: https://ggi.org/wp-content/uploads/2021/08/Insight_Brief_Legal_Policy_Review_Agriculture_Sector.pdf
5. Aşkin Uzel, R. (2021). Slow Food Movement and Sustainability. In: Idowu, S., Schmidpeter, R., Capaldi, N., Zu, L., Del Baldo, M., Abreu, R. (eds) Encyclopedia of Sustainable Management. Springer, Cham. Retrieved from: https://doi.org/10.1007/978-3-030-02006-4_510-1
6. Bosworth, G., Annibal, I., Carroll, T., Price, L., Sellick, J., and Shepherd, J. (2016). Empowering local action through neo-endogenous development; the case of LEADER in England. *Sociol. Rural.* 56, 427-449. doi: 10.1111/soru.12089
7. Chatzichristos, G., Nagopoulos, N., and Poulimas, M. (2021). Neo-endogenous rural development: a path toward reviving rural Europe. *Sociol. Rural.* 86, 911-937. doi: 10.1111/ruso.12380
8. Collection of legislation of the Republic of Uzbekistan. (2023). National database of legislation of the republic of Uzbekistan. Retrieved from: <https://lex.uz/en/>
9. Development Strategy of New Uzbekistan for 2022-2026. (2022). Development strategy center, Uzbekistan. Retrieved from: <https://strategy.uz/index.php?news=1475&lang=en>
10. Dias, R., S., Costa, D., V., T., A., Correia, H., E., Costa, C., A. (2021). Building Bio-Districts or Eco-Regions: Participative Processes Supported by Focal Groups Agriculture, Volume 11, 511 Retrieved from <https://doi.org/10.3390/agriculture11060511>
11. Van der Ploeg, J. D., Barjolle, D., Bruil, J., Brunori, G., Madureira, L. M. C., Dessein, J., ... & Wezel, A. (2019). The economic potential of agroecology: Empirical evidence from Europe. *Journal of rural studies*, 71, 46-61.
12. Egli, L., Rüschoff, J., Priess, J. (2023). A systematic review of the ecological, social and economic sustainability effects of community-supported agriculture. *Front. Sustain. Food Syst.*, 16 2023 Sec. Social Movements, Institutions and Governance. Volume 7 – 2023. Retrieved from: <https://doi.org/10.3389/fsufs.2023.1136866>
13. EU funding programmes. (2023). European Commission. Retrieved from: https://commission.europa.eu/funding-tenders/find-funding/eu-funding-programmes_en
14. EU-Uzbekistan Cooperation Council. (2021). Retrieved from: <https://www.consilium.europa.eu/en/meetings/international-ministerial-meetings/2021/11/16/>
15. FAO. (2018). Organic agriculture in Uzbekistan. Status, practices and prospects. Retrieved from: <https://openknowledge.fao.org/handle/20.500.14283/i8398en>
16. Guareschi, M., Maccari, M., Sciarano, J.P., Arfini, F., Pronti, A. (2020). A Methodological Approach to Upscale Toward an Agroecology System in EU-LAFSS: The Case of the Parma Bio-District *Sustainability*, 12, 5398; doi:10.3390/su12135398
17. Heimann, T. (2019). Bioeconomy and SDGs: does the bioeconomy support the achievement of the SDGs?. *Earth's Future*, 7(1).
18. IFOAM News (2024) Global Organic Area Grows More Than Ever Before. Retrieved from: <https://www.ifoam.bio/news/global-organic-area-grows-more-ever>
19. Key policy objectives of the new CAP. (2023). Retrieved from: https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/new-cap-2023-27/key-policy-objectives-new-cap_en#documents
20. Kinley, A. (2012). Local Food on a Global Scale: An Exploration of the International Slow Food Movement. *Journal of Integrated Studies*, 3(1). Retrieved from: <https://jis.athabascau.ca/index.php/jis/article/view/116>
21. Oliver, A. (2019). Lessons learned from eco-district pilot projects: the importance of stakeholder relations. Thesis of dissertation. University of Montreal, Canada. <https://doi.org/1866/21679>
22. Parente, R., C., Geleilate, J., M., G., Rong, K. (2018). The sharing economy globalization phenomenon: A research agenda. *Journal of International Management*, Vol. 24, 52-64. Retrieved from: <https://www.sciencedirect.com/science/article/abs/pii/S107542531730162X?via%3Dihub>
23. Paula, L., Kaufmane, D. (2020). Community resilience and initiatives for the preservation of natural resources: leader projects in Latvia. 20th International multidisciplinary scientific GeoConference SGEM 2020: proceedings, 20(5.2): *Environmental Economics*, lpp.113-120
24. Puglies, P., Antonelli, A. (2015). I biodistretti in Italia, note introduttive. In: Pugliese, P. Antonelli A., *L'agricoltura biologica in chiave territoriale*. Rapporto finale sull'esperienza dei biodistretti in Italia. Project DIMECOBIO

25. Report on Organic Districts in Europe. (2021). O1-A1: Comparative Analysis on Organic Districts (or Eco-Regions or Bio-Districts) in Europe. Retrieved from: https://www.ecoregion.info/wp-content/uploads/2021/11/O1-A1_Organic_Districts_in_Europe.pdf
26. Statistics agency. (2023). Under the president of the republic of Uzbekistan. Retrieved from: <https://stat.uz/en/official-statistics/agriculture>
27. Stotten, R., Bui, S., Pugliese, P., Schermer, M., Lamine, C. (2017). Organic values-based supply chains as a tool for territorial development: a comparative analysis of three European organic regions. *Int. J. Sociol. Agric. Food* 24, 135–154
28. Stotten, R., Froning, P. (2023). Territorial rural development strategies based on organic agriculture: the example of Valposchiavo, Switzerland. *Front. Sustain. Food Syst.* 7:1182993
29. Strategy for biodiversity conservation in the Republic of Uzbekistan for the period of 2019-2028. (2019). Retrieved from: <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC189329/>
30. The European Green Deal. (2019). European Commission. Retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1596443911913&uri=CELEX:52019DC0640#document2> (accessed on 10 May 2021)
31. The experience of Bio-districts in Italy. (2017). FAO. Retrieved from: <https://www.fao.org/3/bt402e/bt402e.pdf>
32. The Framework Convention for the Protection of the environment for sustainable development in Central Asia. (2006). International Environmental Agreements (IEA) Database. Retrieved from: <http://www2.ecolex.org/server2neu.php/libcat/docs/TRE/Full/En/TRE-143806.pdf>
33. The role of local and regional authorities in making food systems more sustainable. (2020). Case 15 A multi-actor district for the development of organic agriculture in the Province of Salerno, Italy Retrieved from: https://cor.europa.eu/en/engage/studies/Documents/Sustainable_food_systems.pdf
34. Tetera, V., Zeverte-Rivza, S. (2023). Closing Data Gaps to Measure the Bioeconomy in the EU. *Biomass* 2023, 3, 108-122. <https://doi.org/10.3390/biomass3020008>
35. Zanasi, C., Basile, S., Paoletti, F., Pugliese, P., Rota C. (2020). Design of a Monitoring Tool for Eco-Regions. *Front. Sustain. Food Syst.* 4:536392. Retrieved from: doi: 10.3389/fsufs.2020.536392
36. Zeverte-Rivza, S., Girdziute, L., Parlińska, A., Rivza, P., Novikova, A., Gudele, I. (2023). Digitalisation in bioeconomy in the Baltic States and Poland. *Sustainability*. Vol. 15(17), article number 13237. ISSN 2071-1050