ANALYSIS OF THE CURRENT STATE OF CLUSTER DEVELOPMENT IN THE REGIONS OF UKRAINE AND THE WORLD

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Abstract. The cluster approach has become a pivotal model for fostering regional development worldwide, contributing significantly to economic competitiveness, innovation potential, and efficient resource management. This study analyzes the current state of cluster development in Ukraine and compares it with global trends. It highlights the role of clusters in addressing regional economic challenges and improving integration into global markets. Despite its potential, Ukraine faces numerous obstacles in cluster formation, including insufficient funding, weak infrastructure, and a lack of collaboration among businesses, academia, and government. Globally, clusters thrive in industries such as information technology, agriculture, biotechnology, and green energy, with notable success stories in regions like the European Union, the United States, and China. These regions benefit from well-coordinated policies, substantial investments, and developed infrastructure that support cluster growth. In Ukraine, promising sectors such as IT, agriculture, and renewable energy have shown significant progress, yet regional disparities remain a challenge. The uneven distribution of clusters, limited integration into global markets, and an underdeveloped infrastructure hamper their full potential. The study underscores the importance of leveraging global best practices to develop systematic cluster policies, enhance cooperation between stakeholders, and promote innovation. It identifies critical success factors such as state support, advanced infrastructure, favorable investment climates, and international collaboration. Implementing these strategies could transform clusters into key drivers of economic growth and regional development in Ukraine. The findings emphasize the need for a unified approach to cluster policy that considers the unique characteristics and potential of each region. With appropriate measures, Ukraine can harness its natural resources, educational potential, and geographical advantages to establish competitive clusters that contribute to sustainable development.

Keywords: cluster development, regional economy, global trends, innovation potential, economic competitiveness, regional disparities, infrastructure development, cluster policy, sustainable growth.

JEL Classification: R11, O31, O18

1. Introduction

The cluster approach is one of the most effective models for organizing regional development, contributing to enhanced economic competitiveness, innovation potential, and efficient resource management. Globally, clusters play a crucial role in shaping modern economic systems, especially under conditions of globalization and intensified integration processes. In Ukraine, the cluster model is still in its early stages but already demonstrates potential for regional development. This article analyzes the current state of clusters in the regions of Ukraine and the world, highlighting key trends, challenges, and prospects for their development.

Cluster development in Ukraine significantly lags behind that of developed countries, limiting the regional economy's ability to attract investments, foster innovation, and integrate into global markets. The lack of a systematic approach, uneven resource distribution, and weak coordination among government, academic, and business structures are major obstacles to forming effective clusters. Global experience shows that successful cluster policies promote sustainable economic growth, job creation, and infrastructure modernization. Therefore, a thorough analysis of the current state of clusters in Ukraine and the world is necessary to identify strategic directions for their development.

The current state of cluster development in the regions of Ukraine and the world reveals

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both significant progress and existing challenges that are shaped by regional characteristics and international influences. According to Yu. Guzenko and K. Yefimchuk, the globalization process has been a key driver for cluster formation, as the EU's experience demonstrates how transnational cooperation can enhance regional competitiveness through cluster networks. They argue that Ukraine has the potential to replicate similar practices by fostering strategic alliances among regional industries, with particular emphasis on enhancing productivity and innovation capacity (Guzenko, Yefimchuk, 2022). However, the Ukrainian context remains distinct, as certain limitations exist in infrastructure and government support that require a tailored approach to cluster development.

Similarly, Yu. Drachuk, N. Trushkina, and V. Shyposha emphasize the importance of adopting international best practices for the formation of cluster structures in Ukraine. Their research highlights the necessity for adapting these experiences to Ukraine's regional realities, focusing on the role of public-private partnerships in cluster development (Drachuk, Trushkina, Shyposha, 2021). According to them, successful examples of cluster integration from developed countries provide a roadmap for overcoming the existing barriers in Ukraine. Moreover, these examples underline the importance of aligning cluster policies with regional economic development strategies to ensure sustainable growth.

O. Kirdina and O. Doluda explore various theoretical frameworks related to regional economic development, underlining that cluster formation plays a pivotal role in stimulating growth and reducing regional disparities. They argue that clusters contribute to the economic resilience of regions by fostering innovation ecosystems and promoting specialized skills (Kirdina, Doluda, 2023). The Ukrainian regions that have embraced cluster models demonstrate significant progress, but there remains a disparity between different regions due to uneven economic policies and disparities in innovation readiness. This underscores the need for a coordinated regional policy that fosters equitable development across all territories.

In the international context, V. Mishchenko discusses the role of innovative clusters as a tool for achieving regional competitive advantages.

He illustrates that, in both Ukrainian and global cases, a regional approach is crucial for cluster development, particularly in nurturing innovation-driven ecosystems (Mishchenko, 2021). Mishchenko's analysis also suggests that the internationalization of clusters can play an essential role in increasing their efficiency and attractiveness for investments. For Ukraine, building such linkages not only internally but also with neighboring regions and international partners could bolster the regional capacity for growth and innovation.

However, the cluster approach to regional processes is constantly developing, so we consider it appropriate to investigate this issue in more depth.

The purpose of this article is to analyze the current state of cluster development in the regions of Ukraine and the world, identify key issues, trends, and factors influencing the formation of the cluster-based economy model. Based on the obtained data, recommendations are developed to improve cluster policy effectiveness in Ukraine.

2. Statement of the Basic Material of the Research

Modern global trends demonstrate the active development of clusters in such industries as information technology, the agro-industrial sector, biotechnology, and green energy. Leaders in cluster formation include the European Union, the United States, and China. The EU actively supports clusters through special funding programs and innovation incentives. In the United States, clusters are primarily concentrated in high-tech industries such as IT, healthcare, and aerospace. China focuses on creating manufacturing clusters and integrating them into international value chains.

In the modern international context, economists identify three primary geographical centers for the development of innovative clusters. Each of these centers has its unique natural resources and traditions, shaped over an extended period: North America, Western Europe, Asia.

Analyzing the experiences of leading countries in establishing cluster structures, it can be observed that clusters generally emerge at various levels: federal, regional, and micro-levels, taking into account the sectoral characteristics of participants (e.g., transport, tourism, textiles) and types of

innovation (such as technology parks, business incubators, industrial platforms, biotechnology) (Ridei, Gogol, Liubarets, Zemlina, Rodinova, 2021).

Globally, regional clusters are the most developed, followed by micro-clusters, while the fewest clusters are created at the national level. In global practice, three primary clustering models are recognized: the Italian, Danish, and Dutch models. Their general characteristics, typical features, and implementation examples are presented in Table 1.

In Ukraine, cluster development is in its infancy, with many regions just beginning to form such structures. The most notable successes are seen in IT clusters in Lviv, Kyiv, and Kharkiv, which have become centers of technological progress. Additionally, agricultural clusters are actively developing in the southern and central regions, particularly in organic production. However, most regions face challenges such as insufficient funding, weak infrastructure, and a lack of coordination among cluster participants.

The main challenges in cluster development in Ukraine include a low level of cooperation among businesses, academia, and government. There is also a lack of investment in research and innovation, which undermines clusters' global competitiveness. Infrastructure limitations, particularly underdeveloped transport and logistics networks, has hinder clusters' integration into global markets. Another issue is the uneven development of clusters: while major cities account for a significant portion of clusters, rural areas are largely excluded from this process.

Global experience shows that the success of clusters depends on several key factors. These include active government support, developed infrastructure, a favorable investment climate, and strong cooperation among participants. The educational potential of regions also plays a crucial role in providing qualified personnel for clusters. Creating conditions for innovation activities and attracting international partners significantly enhances clusters' efficiency and competitiveness.

Ukraine has significant potential for cluster-based economic development due to its natural resources, geographical location, and educational potential. Promising areas include IT clusters, agricultural clusters, and green energy clusters. Successful implementation of cluster policies requires introducing government incentive tools such as tax benefits, startup support, and the establishment of technology parks. Additionally, integrating Ukrainian clusters into international markets through participation in global projects is essential.

Cluster policy is an important tool for regional development as it enables rational resource utilization, stimulates innovation, and attracts investments. It enhances regional competitiveness, creates new jobs, and improves the quality of life for the population. Successful cluster development also strengthens regions' positions in international economic relations, ensuring their integration into global value chains. To achieve this, effective

Table 1

Features of Basic Models for Forming Regional Innovative Clusters

Model Type	Main Features	Typical Characteristics	Countries
Italian	Cluster formation occurs through evolution without government intervention	Absence of a formalized structure, independent management, financial ties, close family relationships, strong territorial dependence, high independence from the government	Italy, Switzerland, France
Danish	State support for the clustering process	Presence of a network broker with coordination functions; phased learning program development; establishment of contacts among cluster members; development of strategies for cluster networks	UK, USA, Canada, Australia, New Zealand
Dutch	Synergistic effect of combining efforts of manufacturing enterprises and scientific institutions	Access to new technologies, information, and knowledge; active state innovation policy; synergistic cooperation between business and science	Netherlands

Source: Compiled based on (Ridei, Gogol, Liubarets, Zemlina, Rodinova, 2021; National Cluster Development Program until 2027)

interaction among all stakeholders, including businesses, academia, and government, must be ensured.

Most Ukrainian regions consider the cluster model an essential tool for addressing two primary objectives: enhancing the efficiency of the agro-industrial complex and introducing innovations into the industrial sector. These goals are highlighted in the development strategies of nine and seven regions, respectively. Other key areas identified in regional strategies include developing the tourism sector (particularly eco-tourism), intensifying cross-border cooperation with EU countries, supporting SMEs, accelerating regional development, addressing issues in depressed areas, and fostering alternative energy development (Hridniev, 2018).

However, the success of cluster initiatives in developed countries raises questions about why Ukraine still faces obstacles in forming and implementing effective cluster policies. This may be due to a lack of economic prerequisites for cluster development in Ukraine or the absence of sufficient potential. Over 20 years have passed since the emergence of the first clusters in the country, and it was expected that cluster policies would evolve and adapt to market conditions. Yet, the number of successful clusters that have achieved their goals remains extremely low.

This reality contradicts numerous academic studies asserting that clusters can be an effective tool for overcoming crises in the national economy. At the same time, some researchers, when evaluating the outcomes of cluster activities, often disregard comparisons with the successes seen in developed countries, resulting in a distorted perception of the actual situation.

The prioritization of clustering directions in many regions often fails to consider the specific industrial development characteristics and potential for inter-sectoral cooperation. Many regional strategies simply replicate the goals and priorities of other regions without accounting for unique developmental features. This complicates the creation and growth of effective clusters, particularly in the agro-industrial sector and entrepreneurial environments (Hridniev, 2018).

Overall, cluster development is of great importance for economic resilience and growth, both globally and in Ukraine. Ukraine must continue to adopt global best practices to enable clusters to more effectively attract investments, create jobs, and contribute to sustainable regional development.

In conclusion, the current state of cluster development in Ukraine reveals both promising prospects and challenges that need to be addressed to fully unlock regional economic potential. While the adoption of international best practices and the development of public-private partnerships are crucial, it is also essential to adapt these approaches to local realities. The experiences of EU countries provide valuable insights, but Ukraine must consider its own infrastructural limitations and the need for targeted government support to successfully implement similar cluster initiatives. The focus on equitable development and coordinated

Table 2

Application of the Cluster Model in Ukrainian Regions

№	Goal	Region
1	Increasing production efficiency in the agro-industrial complex and realizing agricultural enterprises' potential	Vinnytsia, Zhytomyr, Zakarpattia, Ivano-Frankivsk, Kirovohrad, Poltava, Ternopil, Khmelnytskyi, Chernivtsi, Chernihiv
2	Implementing innovation processes in industrial sectors	Vinnytsia, Zhytomyr, Zakarpattia, Kirovohrad, Ternopil, Chernivtsi
3	Strengthening the potential of small and medium-sized enterprises and expanding their infrastructure	Volyn, Poltava, Chernivtsi, Lviv, Kherson
4	Ensuring innovative development of recreational enterprises and tourism infrastructure	Ternopil, Kherson, Chernivtsi, Chernihiv
5	Intensifying cross-border cooperation with EU countries	Vinnytsia, Zakarpattia, Lviv
6	Increasing proportional regional development	Zhytomyr, Kyiv, Mykolaiv
7	Ensuring the development of alternative energy and renewable energy sources	Ivano-Frankivsk, Chernihiv

Source: Compiled based on (Avershyn, 2021; Hridniev, 2018)

regional policies is critical to bridge the existing disparities between different regions of the country.

Moreover, the role of clusters in fostering innovation, specialization, and international cooperation cannot be understated. By building effective linkages within and beyond national borders, Ukrainian regions have the opportunity to strengthen their competitiveness and enhance innovation-driven ecosystems. The internationalization of clusters is a powerful tool for attracting investments and increasing the overall efficiency of regional development initiatives. Therefore, it is vital for Ukraine to focus on establishing strong networks both domestically and internationally, which would support sustainable economic growth and resilience in the face of global challenges.

3. Conclusions

Cluster development is a critical component of regional economies, contributing to increased efficiency and innovation. Globally, clusters demonstrate high effectiveness due to well-established cooperation among all participants, while Ukraine has significant potential to realize the cluster model. However, overcoming current challenges such as insufficient funding, uneven regional development, and weak collaboration among businesses, academia, and government is essential. Leveraging global experience and implementing systematic cluster policies can help create a competitive economy capable of adapting to modern challenges. Ukraine has all the necessary prerequisites for effective cluster development, which can become the foundation for sustainable economic growth.

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