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ADVANTAGES OF CLUSTERS IN UKRAINE'S RECOVERY

Natalya KOLISNICHENKO
Institute of Public Service and Management of the Odessa Polytechnic National University
Genuezka Str. 22, Odesa, 06509
e-mail: natakolisn2@gmail.com
ORCID ID: https://orcid.org/0000-0003-1083-7990

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Abstract: *The paper examines the advantages of clusters in Ukraine's recovery by studying their characteristics and innovative nature. Factual and analytical material was developed using logical-factual, comparative methods and systematic analysis. It clarifies the definition of a cluster and investigates the features of state cluster policy and cluster management. It a revealed that today, clusters play the role of drivers in Ukraine's recovery by supporting creative technologies, critical infrastructure, and other progressive changes. A SWOT analysis of the directions in the development and implementation of clustering in Ukraine's recovery is provided, listing its advantages (e.g. use of competitive advantages of a region; general economic growth and development of cities-agglomerations etc.) and disadvantages (e.g. lack of regulatory ensuring of clusters' functioning; lack of financial security of cluster development; lack of clustering experience etc.). The essence of innovative clusters is revealed: transfer innovation clusters, integration innovation clusters, innovation-industrial clusters, social innovation clusters (the aim of which is to create conditions for mastering advanced technologies), and multifunctional full-cycle innovation clusters (encompasses the entire spectrum of innovative activities). It is determined that the issue of public cluster policy requires a systematic solution. Cluster policy should have the opportunity to implement additional tools to support clusters in having a greater impact on the country's reconstruction, as cluster policy can influence the implementation of strategically important national and regional projects and activate innovative activities. The relevance of cluster development remains a new research problem, creating the need for further in-depth research and analysis.*

Keywords: *cluster, clustering, innovation, innovative cluster, social cluster, reconstruction.*

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1. The formulation of the problem.

Ukraine needs funds for recovery, which it does not have. Therefore, international financing needs to be attracted. Specific funds, development banks, and entire countries are ready to support Ukraine. Funds can be attracted in small portions for individual projects, or this can be done more comprehensively to avoid disjointed work. It makes sense to have an integrated approach, and there has been an attempt to develop one in Ukraine. The initiative came from the EU, which announced its readiness to create the Ukraine Recovery platform to work together on country's reconstruction. Following this, the President initiated the creation of the National Recovery Council. This advisory body includes the senior officials of the government and various experts. It was established in April, and then more than 20 working groups on specific topics were formed. In total, over 2,000 people worked on the Recovery Plan. Its fundamental principles were developed together with Ukrainian civil society organizations - with over 50 NGOs. Each working group, with the participation of experts and the public, developed its vision of reconstruction in its field.

2. Recent literature in the area.

Various aspects of cluster policy in increasing society's development and its efficiency are examined by Vasylkivskyi D. [1], Voinarenko M. [2], Yurchak O. [8] and others. The importance of clusters in ensuring sustainable development of regions is revealed in the works by Nekhachuk D [4], Chuzhykov V. [8] and others. Clusters in the development of national economy is a focus in research by and others.

3. The aim and tasks of the paper.

The aim of the paper is to examine the advantages of clusters in Ukraine's recovery including examining of their characteristics and innovative nature.

4. The main body of the paper and the obtained results.

Creation and development of clusters is recognized as one of the most important areas in the strategy development of any region.

Cluster policy can be considered as a set of state regulatory initiatives carried out by government authorities to enhance the competitiveness of the country's economy by creating conditions for the development of clusters. In Ukraine, public cluster policy is still at the stage of its formation.

When analyzing the modernization of the innovation environment and the general theory of clustering, it became evident that an industrial cluster is capable of developing innovative products most productively, and this subsequently becomes the main reason for a high level of competitiveness and stable economic growth. Clusters are aimed at innovation and discovering new markets for products. When studying Ukrainian and foreign research on the theory of clustering, it becomes possible to clarify and supplement the interpretation of the concept of «cluster».

Clusters are «new institutions» that do not depend on previous conditions of development, but constitute the architecture and integration processes of counterparties in a single economic chain to ensure the alignment of social and economic processes as effective and flexible institutional structures [6, p. 82]. In the modern understanding, a cluster is an organizationally designed, locally integrated structural network of legally independent subjects interested in cooperation and the use of its results in a certain field of activity with the coordination of actions and program development within the limits of a clearly defined strategy [6, p. 97]. The cluster is also considered as a sectoral, territorial non-voluntary association of organizations that closely cooperate with each other and other subjects in the

production and sales chain of value creation in order to increase the competitiveness of their own products and their exports, reduce transactional and economic costs of activity and promote the economic development of regions [11]. For instance, the definition of a municipal cluster is given as «a network business unit created with a view to satisfying the interests of members of the local community under the auspices of the local self-government body, with its direct (role) or indirect participation (through the existing or newly created utility enterprise), which integrates and coordinates the activities of participants (small and medium-sized businesses, utility enterprises, research, educational, public and other non-commercial organizations) with the aim of increasing the competitiveness of each of them, the cluster itself and the local community as a whole» [7].

In cluster policy, industrial, regional policies, small business support policies, policies for attracting foreign and domestic investments, innovation, scientific and technical, educational, and other policies are interconnected. The implementation of cluster policy involves measures aimed at removing obstacles that hinder the establishment of mutually beneficial relationships between cluster participants. Authorities play a leading role in the processes of clustering, particularly in the formation of infrastructure to meet the needs of the cluster, as well as directly influencing competitiveness factors. State cluster policy is implemented to improve existing clusters or in the development of clusters that are in the initial stage. There are tools suitable for achieving the goals of cluster policy, but due to the unique nature of clusters, it is difficult to identify universal approaches [1, p. 27]. The dynamism of social processes, including economic ones, compels the government and entrepreneurs.

Clusters are able to provide better organization and production capacity in solving the problems of increasing productivity and quality of work, increasing the speed of operational activities, efficiency of logistics processes and innovative production modernization, solving issues of optimal combination of market and non-market management methods, creating a hybrid type of partnership, quickly responding to the appearance of changes in the environment and have other features that allow us to consolidate efforts to solve the problems that have arisen.

The capabilities of clusters as an organizational form in regulating activity have led to their wide application throughout the world due to the integration of the potentials of enterprises and workers of the territories. The picture of the state of Ukrainian clusters has not yet been systematized and is not sufficiently specified. Thanks to the support of the European Union, the first formalized association that activated the cluster movement in Ukraine became the Ukrainian Cluster Alliance (UCA) by analogy with the European Cluster Alliance (ECA) [11]. Coordinators and experts of cluster initiatives discussed and created the National Program of Cluster Development until 2027. Clusters were assigned the role of drivers of Ukraine’s smart specialization, generators of support for creative technologies and critical infrastructure of food security and other progressive changes, their focus on the integration of management of sectors with the use of integrated management of added value chains, management of development and readiness to take on a share of the tasks of integration with the European Union was determined [11].

Advantages of the cluster: economic, legal, and financial independence of the participants; voluntary participation; territorial combination of business entities; potential for reducing the cost of the product; increase in market share; mobilization of resources; opportunity for participants to join other associations; development of resource potential and regional infrastructure; involvement of scientific institutions and local authorities in cooperation; strengthening of participants' competitive advantages.

Disadvantages of the cluster: cooperation between participants is limited to the framework of the contract; limited possibilities for joint actions; conflict of interests among participants; need for state support [3].

A cluster is more than just a critical mass of «the right ingredients» – such as firms and

assets – but also includes these networked relationships and flows and exchange of knowledge, ideas and people throughout the cluster. Innovation clusters range from globally recognised centres of innovation excellence, to fast emerging clusters and those which are key significance to their local economy [12, p. 5]. Global experience in the formation of innovative clusters allows several clustering directions as guidelines for the development and implementation of both autonomous innovation-investment projects and comprehensive clustering programs within specific regions.

Table 1 SWOT analysis of directions for the development of the implementation of clustering in Ukraine's recovery

Strengths	**Weaknesses**
Use of competitive advantages of a region. General economic growth and development of cities-agglomerations formed under the influence of clustering. Accelerated build-up infrastructural and personnel potential. Competitive cost of labor. Quick adaptation to new market needs. Development of a competitive network suppliers and service organizations, including small and medium enterprises. Interaction of business, government, public and science	The lack of regulatory ensuring of clusters' functioning. Lack of financial security of cluster development. Lack of clustering experience. Lack of access to modern management methods, including cost accounting, and special knowledge. Lack of keeping full and detailed records of clusters. The undeveloped scientific research. There are no governmental bodies in the field of cluster policy. Regional development disparities. Lack of support for entering highly competitive international markets
Opportunities	**Threats**
Increased productivity. Increased obligations of production. Reaching local budgets. Formation of new companies and creation new working places. Growing innovative regional potential. Formation of competitive advantages. Foreign investments. Satisfaction with the needs of local communities. Implementation of the best available technologies using the latest equipment. Support for the creation of clusters by the state	Restrictions due to the martial law. Decrease in domestic demand and a significant weakening of external demand for Ukrainian export goods. Slow economic recovery. Acceleration of inflation. Increase in the outflow of labor (including skilled workers) abroad. Insufficient state support.

Transfer Innovative Clusters. One of the most popular clustering directions in countries that are just beginning their innovation industrialization is «technology transfer» clusters the aim of which is to create conditions for mastering advanced technologies that currently represent the forefront of technological development worldwide. Transfer innovative clusters are a type of clustering strategy where countries or regions adopt and integrate advanced foreign technologies to accelerate their technological development. These clusters focus on the «transfer» of cutting-edge technologies from more technologically advanced regions or countries. Transfer innovative clusters are characterized with: adoption of foreign technologies involving importing technology, «know-how», and best practices to improve local industry capabilities; technological upgrading aiming to help local industries transition to a higher technological level leading to the development of new products, processes, and services that are more advanced and competitive; economic development, creating high-skilled jobs, and enhancing the overall competitiveness of their industries; collaboration and partnerships between local firms, foreign technology providers, research institutions, and government agencies; building infrastructure, such as technology parks, research centers, and innovation hubs; policy support in encouraging financial incentives, regulatory support, and initiatives to promote international cooperation. As Fioravanti S. and others say, the transfer of knowledge is influenced by factors, facilitators or inhibitors such as: cooperation, relationship with institutions, workforce mobility and geographical proximity, influencing the

competitiveness and performance of the organizations in the cluster [10].

Integration Innovative Clusters. Integration innovative clusters refer to a type of clustering strategy where economic integration processes are combined with the formation of specialized innovative clusters within a group of countries or regions. These clusters are designed to foster collaboration and integration across different economic sectors and countries, aiming to enhance regional competitiveness and economic development. Integration innovative clusters are characterized with: economic integration to create a seamless economic environment; specialization and collaboration and resource-sharing among member states to achieve economies of scale and scope; innovation and technology transfer across borders leading to the development of new products and processes that benefit from shared expertise and resources; policy alignment when member states align their policies and regulations to facilitate cross-border cooperation and the functioning of the cluster with harmonizing standards, trade policies, and regulatory frameworks; infrastructure development, such as transportation networks, communication systems, and research facilities; skills development across borders including initiatives for education, training, and professional development that support innovation and technology adoption; sustainable development, including environmental sustainability and social responsibility to ensure long-term benefits for all member states; political and institutional support from participating countries to overcome barriers to integration and ensure the success of collaborative efforts. Integration innovative clusters aim to leverage regional economic integration to promote innovation, enhance competitiveness, and achieve sustainable economic development across participating countries or regions. The formation of integration innovative clusters is vital in creating a unified innovation space.

Innovative-Industrial Clusters. This type of cluster involves participants who regularly and systematically engage in innovative activities aimed at the development and production of innovative and high-tech (science-intensive) products. innovative-industrial clusters are a type of clustering strategy that focuses on fostering innovation and technological advancement within specific industrial sectors. These clusters bring together companies, research institutions, universities, and other organizations to collaborate and are characterized with: focus on innovation within industrial sectors that enhance competitiveness and drive economic growth; collaboration and networking among companies, research institutions, and universities to encourages knowledge sharing, joint research projects, and the exchange of best practices; high-tech products and services focusing on producing high-tech, often science-intensive, products and services; research and development (R&D) activities aimed at creating innovative solutions to industry-specific challenges involving fundamental research, applied research, and experimental development; economic growth and job creation by promoting innovation and technological advancement; infrastructure and support services, such as technology parks, incubators, and innovation centers, to facilitate R&D and commercialization activities; policy and regulatory support by Governments to encourage funding programs, tax incentives, and regulatory frameworks that support innovation and entrepreneurship; international collaboration to access global markets, technologies, and talent pools including partnerships with foreign companies, participation in international research projects, and joint ventures.

Social Innovative Clusters. Social clusters exhibit several structural characteristics that make them particularly well suited to the development of new social innovation. Social innovations are a response to the growing needs and social challenges [13, p.28]. This type of cluster is functioning in countries with developed market economies, addressing social challenges and improving the quality of life through innovation. According to K. Tanimoto and M. Doi this type of clusters is an organizational accumulation which creates a new solution for diverse social issues and a new social value, by cooperative and competitive relationships between various organizations, such as social enterprises, support organizations, financial agencies, universities and R&D entities, etc. [14]. So, these clusters bring together various

stakeholders, including government agencies, non-profit organizations, private companies, research institutions, and community groups, to collaboratively develop and implement innovative solutions to social problems. They are characterized with: focus on social challenges such as healthcare, education, social inclusion, poverty alleviation, and environmental sustainability aiming to create positive social impact and improve community well-being; collaboration and multi-stakeholder engagement by bringing together different perspectives and expertise, developing more holistic and effective solutions to social challenges; healthcare innovation, developing new medical technologies, treatments, and healthcare delivery models aiming to improve access to healthcare, enhancing the quality of care, and reducing healthcare costs; education and skill development including new educational technologies, curricula, and training programs that address the needs of diverse populations; social inclusion and equity by developing solutions that address the needs of marginalized and underserved communities including projects focused on affordable housing, job creation, and access to essential services; sustainability and environmental impact aiming to develop eco-friendly solutions that address environmental issues including projects related to renewable energy, waste management, and sustainable agriculture; community-based approaches to ensure that solutions are tailored to the specific needs and contexts of local populations; policy and advocacy to create an enabling environment for social innovation including advocating for supportive policies, funding, and regulatory frameworks that facilitate social entrepreneurship and innovation; measurement and impact evaluation using data and evidence to assess the effectiveness of their solutions and to continuously improve their approaches; funding and support, including government grants, philanthropic contributions, corporate social responsibility (CSR) funds, and impact investments providing support services such as incubation, mentoring, and capacity building to social enterprises and innovators.

Multi-functional Full-Cycle Innovative Clusters. This type of cluster encompasses the entire spectrum of innovative activities. The core of such clusters includes research institutes and other organizations focused on fundamental research in natural and humanities sciences. It includes design bureaus, innovation centers, and other venture business entities. An essential component of these clusters is educational institutions. Full-cycle innovative clusters include high-tech manufacturing companies that create science-intensive products with very high added value. Currently, research institutes and universities in Ukraine operate autonomously in the economy. In turn, most Ukrainian manufacturers are not particularly interested in establishing high-tech production. The main reason is that the implementation of innovations is always associated with significant commercial risks.

Under economic clustering in Ukraine there should be an expanded approach to cluster public policy improvement. There is a need in the new industrial policy, based on the clustering of the economy which depends on security in effective development of the economy of Ukraine and development of an innovative model in industry, which is determined by the purposes of application cluster approach.

Under such conditions, the creation of favorable macroeconomic, informational and regulatory environment for clusters' development of the economy has a priority direction.

5. Conclusions and prospects for further research.

The situation with solving problems in cluster public policy needs a systemic solution. Cluster policy should get the ability to implement additional tools in supporting clusters in order to have the greater impact on economic growth in the country. Thanks to the stimulating measures cluster policy will be able to influence the implementation of the strategically important national and regional projects, to activate innovative activities. The relevance of clusters' development remains a new research problem which creates a necessary to conduct further in-depth research and analysis.

Author details ((in Ukrainian)
ПЕРЕВАГИ КЛАСТЕРІВ У ВІДБУДОВІ УКРАЇНИ

Наталя КОЛІСНІЧЕНКО
Інститут публічної служби та управління
Національного університету «Одеська політехніка»
Генуезька 22, м. Одеса, 65009
e-mail: natakolisn2@gmail.com
ORCID ID: https://orcid.org/0000-0003-1083-7990

Анотація. *У статті розглядаються переваги кластерів у відновленні України шляхом вивчення їх характеристик та інноваційного характеру. Фактичний та аналітичний матеріал опрацьовано за допомогою логічно-фактичного, порівняльного методів та системного аналізу. Уточняється визначення кластеру. З'ясовуються особливості кластерної політики держави та управління кластерами. Зазначається, що на сьогодні кластерам відводиться роль драйверів відбудови України у підтримці креативних технологій та критичної інфраструктури а також інших прогресивних змін. Надається SWOT-аналіз напрямів розвитку впровадження кластеризації у відновленні України з переліком її переваг (зокрема, використання конкурентних переваг регіону, загальне економічне зростання і розвиток міст-агломерацій, тощо) та недоліків (відсутність нормативної бази забезпечення функціонування кластерів, відсутність фінансового забезпечення розвитку кластеру, відсутність досвіду кластеризації тощо). Розкривається сутність інноваційних кластерів: трансферних інноваційних кластерів (метою якого є створення умов для оволодіння передовими технологіями); інтеграційних інноваційних кластерів; інноваційно-промислових кластерів; соціальних інноваційних кластерів; багатофункціональних інноваційних кластерів повного циклу (охоплює весь спектр інноваційної діяльності). Визначено, що проблема кластерної державної політики потребує системного вирішення. Кластерна політика повинна отримати можливість впровадження додаткових інструментів підтримки кластерів, щоб мати більший вплив на відновлення країни так як кластерна політика зможе впливати на реалізацію стратегічно важливих національних та регіональних проектів, активізувати інноваційну діяльність. Актуальність розвитку кластерів залишається новою дослідницькою проблемою, що створює необхідність проведення подальших поглиблених розробок та аналізу.*

Ключові слова: *кластер, кластеризація, інновація, інноваційний кластер, соціальний кластер, відбудова.*

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://sepd.tntu.edu.ua/images/stories/pdf/2024/24knmiur.pdf

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