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Structure and characteristics of innovation ecosystems of territorial communities

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Purpose. *The purpose of the article is to provide a theoretical substantiation of the essence, structure, and key characteristics of innovative ecosystems of territorial communities, as well as to identify the specific features of interaction among their main actors and resource, institutional, and network components in the context of enhancing the innovation capacity and competitiveness of communities under conditions of decentralization, digital transformation, and intensifying global competition.*

Methodology. *The methodological basis of the study includes the ecosystem, systemic, structural-functional, and comparative approaches. The research employs the methods of theoretical generalization, scientific abstraction, comparative analysis, structuring, and formalization.*

Findings. *The article demonstrates that the classical models of the innovation system and innovation cluster have limited explanatory power with regard to local innovation processes, since they do not sufficiently take into account the intersectoral nature of interaction, the social dimension of innovation, and the facilitative role of local self-government. It is substantiated that the innovative ecosystem of a territorial community is an open, dynamic, and co-evolutionary system within which business, the scientific and educational sector, local self-government bodies, civil society, and infrastructure institutions interact.*

Originality. *The scientific novelty of the study lies in deepening the theoretical foundations of the ecosystem approach to the analysis of innovative development of territorial communities, substantiating the author's interpretation of the innovative ecosystem of a community, and developing a formalized multi-component model of its functioning.*

Practical value. *The practical significance of the obtained results lies in the possibility of using the proposed theoretical provisions, structural model, and system of indicators in the process of shaping local economic policy, strategies for the innovative development of territorial communities, programs to support entrepreneurship, the development of human capital, and digital infrastructure. The research results may be applied by local self-government bodies and developers of regional and local programs in order to enhance the institutional capacity of communities and strengthen their competitive positions.*

Keywords: *regional development, innovation ecosystem, territorial community, human capital, innovation development, network interaction, competitiveness.*

Introduction

Under deepening decentralization, digital transformation, and stronger global competition, territorial communities are increasingly viewed as active actors of innovation-led development capable of shaping their own trajectories of economic growth. The shift from hierarchical governance to network-based interaction has intensified the relevance of innovation-oriented economic ecosystems in which business, science, education, local self-government, civil society, and infrastructure institutions are combined within a common developmental logic.

Innovation-oriented economic ecosystems of territorial communities are characterized by a complex internal structure, multi-level linkages, and a heterogeneous set of participants whose interests and resources must be coordinated within a shared development strategy. Their effectiveness depends not only on the presence of individual innovation actors, but also on the quality of the institutional environment, the level of social capital, the development of innovation and digital infrastructure, and the ability of local authorities to perform coordinating and facilitating functions.

Against this background, a systematic understanding of the structure and key characteristics of such ecosystems is necessary for designing effective local

economic policy instruments, enhancing the innovation capacity of communities, and strengthening their competitiveness in national and global economic space.

Literature Review

The theory of general systems, which underlies the concept of the innovation ecosystem, frames it as a set of interrelated elements whose interaction generates an integrated innovation outcome. This perspective dominates most contemporary studies and treats the innovation ecosystem not as a simple sum of participants in innovation activity, but as a complex, dynamic, and open system (Petchenko, 2019).

Within a structural approach, A. Zaprovodyuk emphasizes three key components of the innovation ecosystem: innovation strategy, a set of research and product-development processes, and the instruments and resources that support innovation activity (Zaprovodyuk, 2017). R. Yaremchuk and O. Kolomiyets (Yaremchuk, & Kolomiyets, 2016) propose a structural model based on resource blocks and their functional purpose, which deepens the understanding of resource provision in innovation processes but pays less attention to institutional and network dimensions.

M. Prokopenko, Yu. Yeremenko, and V. Omelyanenko identify five basic elements of the innovation ecosystem: the scientific, educational, engineering, and technical sector; venture investment; innovation infrastructure; stable demand for innovation; and the legal and regulatory framework. This approach is comprehensive, yet it is oriented mainly toward macro- and meso-level analysis (Prokopenko, Yeremenko, & Omelyanenko, 2014).

A major contribution to the development of innovation ecosystem theory has been made by foreign scholars such as A. Bramwell, N. Etzkowitz, L. Leydesdorff, P. Cooke, R. Adner, and D. Audretsch, who interpret innovation ecosystems through the lenses of network interaction, the triple helix, open innovation, and actor co-evolution (Bramwell, 2012; Adner, 2006; Audretsch, 2005). Their work laid the foundation for understanding ecosystems as structured yet adaptive formations capable of self-organization and development under global competition.

Despite this substantial body of research, the structure and characteristics of innovation-oriented economic ecosystems of territorial communities remain insufficiently systematized. This creates the need for further research that integrates systemic, structural, and territorial approaches into a single analytical framework.

Purpose of the Study

The purpose of the article is to provide a theoretical justification and systematization of the structure and key characteristics of innovation-oriented economic ecosystems of territorial communities and to identify the features of interaction among their main actors, institutional components, and resource base in order to build a methodological foundation for enhancing the innovation capacity and competitiveness of territorial communities under contemporary socio-economic transformations.

Methodology

The methodological basis of the study includes the ecosystem, systemic, structural-functional, and comparative approaches. The research employs the methods of theoretical generalization, scientific abstraction, comparative analysis, structuring, and formalization.

Within the methodological framework, the study also applies elements of system modeling, an indicator-based approach, and structural-logical analysis, which allow for a comprehensive examination of the formation and functioning of innovation ecosystems of territorial communities. The use of factor analysis enables the identification of key determinants influencing innovation capacity, including institutional conditions, resource availability, and the intensity of network interaction among ecosystem actors. Furthermore, scenario analysis is

employed to assess potential trajectories of ecosystem development under conditions of decentralization, digital transformation, and external uncertainty. Such a multi-level methodological approach ensures the reliability of analytical conclusions and provides a scientific basis for the development of effective strategies aimed at strengthening the innovation capacity and competitiveness of territorial communities.

Results and Discussion

In contemporary economic thought, the concept of the innovation ecosystem emerged as a response to the limitations of linear and hierarchical models of innovation development, which failed to account for the complexity, non-linearity, and multidirectionality of interaction among innovation actors. The theoretical foundations of the innovation ecosystem concept lie in general systems theory, evolutionary economics, institutionalism, and the approaches of open innovation and network interaction.

In the broadest sense, an innovation ecosystem can be defined as a dynamic set of interrelated actors, institutions, resources, and processes that jointly ensure the generation, diffusion, adaptation, and commercialization of knowledge and technologies. In contrast to traditional innovation systems, the ecosystem approach focuses less on separate elements and more on the character and quality of the relationships among them.

Foreign scholars such as R. Adner, N. Etzkowitz, L. Leydesdorff, A. Bramwell, and D. Audretsch regard the innovation ecosystem as a network-based form of organizing innovation activity in which actors, technologies, and markets co-evolve. R. Adner, in particular, stresses that an innovation ecosystem is a structure of interdependencies in which the success of innovation depends not only on the capabilities of a single actor, but also on the readiness of the whole system to support value creation (Adner, 2006; Etzkowitz, 2022; Leydesdorff, 2016; Bramwell, 2012; & Audretsch, 2005).

In Ukrainian scholarship, the innovation ecosystem is mainly interpreted as an institutionally and resource-supported environment that creates conditions for innovation activity. Fedulova and Marchenko define it as a set of organizational, functional, and institutional elements and relations that ensure the continuity of the innovation process, whereas Petchenko emphasizes the distinction between innovation actors and the innovation ecotope, allowing the ecosystem to be viewed as a holistic environment for innovation functioning.

Generalizing existing approaches, the essence of the innovation ecosystem can be disclosed through the following core characteristics:

- systemicity and integrity: the ecosystem operates as an integrated organism in which changes in one element affect the others;
- networked interaction: the absence of rigid hierarchy and the predominance of horizontal linkages;
- openness and adaptability: the capacity to incorporate new actors, knowledge, and technologies;
- co-evolutionary development: the simultaneous evolution of actors, institutions, and markets;
- orientation toward value creation rather than purely technological novelty.

Thus, the innovation ecosystem should be treated not merely as a form of organizational coordination, but as a socio-economic space of interaction in which innovation emerges through joint activity, alignment of interests, and the synergy of resources.

In studies of innovation-led development, the notions of the innovation system and innovation cluster are often used in parallel, although they reflect different levels of organization, interaction logic, and mechanisms of innovation formation

(Lundvall, 1992). Their distinction is methodologically important for substantiating the concept of innovation ecosystems, especially at the level of territorial communities (Table 1).

Table 1

Comparative Characteristics of the Innovation System, Innovation Cluster, and Innovation Ecosystem

Comparison criterion	Innovation system	Innovation cluster	Innovation ecosystem
Theoretical foundation	Innovation systems theory; institutionalism	Competitive advantage theory; regional economics	General systems theory; network theories; open innovation
Level of formation	National; regional	Local; regional	Local; regional; global
Key actors	State; research institutions; business; financial institutions	Firms in the same or adjacent industries; suppliers; universities	Business; science; education; government; community; infrastructure and social actors
Nature of interaction	Predominantly hierarchical; institutionally regulated	Horizontal; market-based	Networked; co-evolutionary
Role of the state	Central; coordinating; regulatory	Indirect; supportive	Facilitating; integrative
Spatial localization	Not critical	Geographical concentration	Open to external linkages
Sectoral orientation	Economy-wide	Clearly defined industry or technology	Multisectoral; cross-sectoral
Primary goal	Enhancing the innovation capacity of the economy	Increasing firms' competitiveness	Creating and scaling value through innovation
Development dynamics	Relatively stable; inertial	Moderately dynamic	Highly dynamic; adaptive
Social dimension	Secondary	Limited	Integrated
Outcome	Innovation activity of the economy	Sectoral innovation; agglomeration effects	Sustainable innovation-led development

Source: compiled by the author based on (Freeman, 1987, p. 36).

The comparative analysis indicates that the innovation system and the innovation cluster are important but analytically limited models for explaining innovation processes at the level of territorial communities (Adner, 2017).

First, the innovation system is primarily oriented toward macro- and meso-level governance, where state institutions, strategic documents, and formalized innovation-policy mechanisms play the central role. Within this approach, a territorial community is treated more as an object of public policy than as an autonomous actor of innovation development. This makes it difficult to take local specificities, endogenous potential, and informal mechanisms of interaction into account.

Second, although the innovation cluster gravitates toward the local level, it remains constrained by sectoral and technological specialization. Territorial communities, as a rule, possess a diversified economic structure and combine economic activity with social initiatives, educational projects, and cultural development. In such conditions, the cluster approach cannot fully capture the entirety of interactions among economic, social, and institutional actors within the community.

Third, neither the innovation system nor the cluster concept pays sufficient attention to the social and civic dimension of innovation. For territorial communities,

innovation is related not only to technology or business, but also to better quality of life, human capital development, and social and managerial innovation.

In this context, the innovation ecosystem appears to be a conceptually more adequate model for analyzing and designing the innovative development of territorial communities. It makes it possible to treat the community as an active integrator of actor interaction, to combine economic, social, and institutional dimensions of innovation, to account for communities' openness to interregional and global innovation networks, and to explain the non-linear and co-evolutionary nature of local development.

Accordingly, the ecosystem approach creates theoretical preconditions for a new research direction centered on innovation-oriented economic ecosystems of territorial communities that extends beyond the classical models of innovation systems and clusters (Kozlova, 2024).

The formation of innovation ecosystems at the level of territorial communities is qualitatively different from national or regional models of innovation development. This is due to the combination of local spatial identity, limited resources, direct interaction among actors, and the strong role of informal institutions. In this context, a territorial community is not merely a spatial unit, but a socio-economic environment in which innovation arises as a response to specific local needs.

The empirical evidence indicates that Ukraine has already developed the basic institutional framework for the emergence of innovation ecosystems in territorial communities, although its practical effects remain uneven across different types of territories. On the one hand, the logic of public investment management has been incorporated into the Budget Code, and the Cabinet of Ministers' Resolution No. 527 introduced a procedure for the preparation, evaluation, and implementation of investment projects at the regional and local levels (Lukyanova, 2025). This marks a transition from fragmented financing to a more systemic model in which a community can form its own portfolio of development priorities. On the other hand, the existence of a new institutional framework does not automatically mean that all communities are equally prepared to use it.

A key precondition for an innovation ecosystem is the financial capacity of the community, because without it there is no sustainable basis for maintaining infrastructure, human capital, business support services, or co-financing innovation projects. In 2024, the general fund revenues of local budgets in Ukraine amounted to UAH 451.1 billion, of which UAH 257.5 billion, or 57.1%, came from the personal income tax. This structure reveals a high dependence of community development opportunities on the local labor market and business activity (Figure 1).

At the same time, the assessment of 1,331 territorial communities for 2024 showed that only 34.3% had a high level of financial capacity, 21.3% an optimal level, 18.2% a satisfactory level, 16.4% a low level, and 9.8% a critical level (Onyshchuk, 2025). Thus, roughly every fourth community lacks a sufficient fiscal safety margin to launch a full-fledged innovation ecosystem without external support (Kazyuk, Ventsel, 2025) (Table 2).

The second systemic precondition is the existence of an entrepreneurial environment capable of generating demand for innovation. According to OECD estimates, SMEs account for 99.9% of all enterprises in Ukraine, provide 81.6% of business employment, and create 70.2% of value added. This means that the potential core of local innovation ecosystems in communities is formed not by large corporations but by small and medium-sized firms. At the same time, the war economy has substantially weakened this base: 64% of SMEs temporarily suspended or discontinued operations after the start of the full-scale invasion, and the UBI business activity index in March 2025 stood at only 38.6 out of 100. Nevertheless, the entrepreneurial fabric has not been destroyed: at the beginning of 2025, 75%

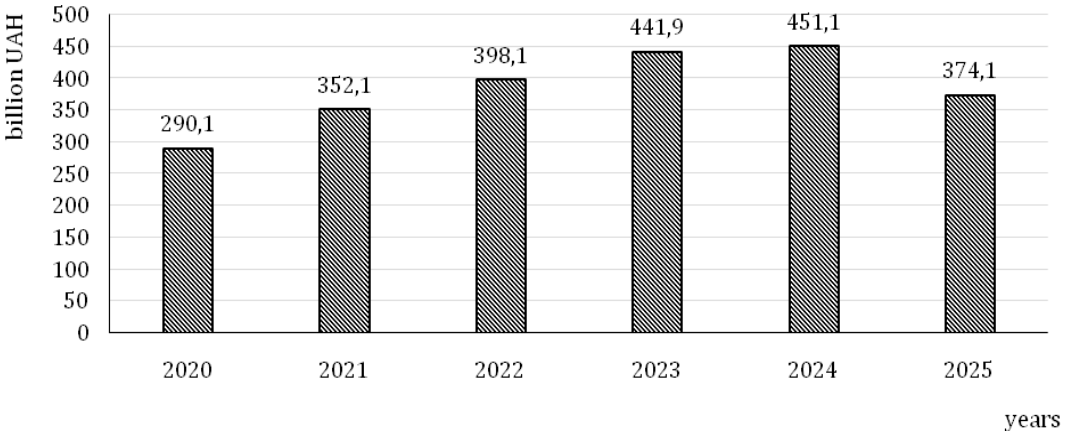

Fig. 1. **Dynamics of the financial capacity of territorial communities, 2020-2025, billion UAH**
Source: compiled by the author based on the Decentralization Portal data (Onyshchuk, 2025).

Table 2

Distribution of Territorial Communities in Ukraine by Level of Financial Capacity, 2024

Group of communities	Levels included	Number of communities	Share of total, %	Analytical characteristic
Communities with high financial capacity	High	456	34.3	The most fiscally resilient communities with greater potential for self-financing development, investment, and local programmes
Communities with medium financial capacity	Optimal + satisfactory	526	39.5	Communities with an acceptable fiscal base but a need to strengthen revenue capacity, expenditure efficiency, and investment activity
Communities with low financial capacity	Low + critical	349	26.2	Communities with limited resource potential, high dependence on external support, and weaker opportunities for implementing development strategies
Total	—	1,331	100.0	—

Source: compiled by the author based on the Decentralization Portal data (Onyshchuk, 2025).

of companies were operating at full capacity, and 18,277 new companies were registered in the first half of 2025 (Figure 2).

An important role is also played by the infrastructure that supports entrepreneurship. OECD reports directly indicate that Ukraine has already formed a relatively strong institutional basis for the digitalization of SMEs at both national and subnational levels owing to the Ministry of Digital Transformation, the network of chief digital transformation officers, and the development of Diia.Business centres. By the end of 2025, the network comprised at least 16 offline centres. At the same time, OECD also emphasizes that smaller towns and rural communities still lack awareness of the benefits of digitalization and that regular public-private interaction at the local level remains insufficient (Organization for Economic Co-operation and Development, 2024, May 22).

The third basic precondition is the digital maturity of the territory. At the national level, Ukraine demonstrates strong results: in 2025, it ranked fifth in the world in the UN Online Services Index, entered the World Bank's group of GovTech Leaders, and maintained relatively strong positions in open data. At the level of communities, however, the picture is much weaker: the average index of

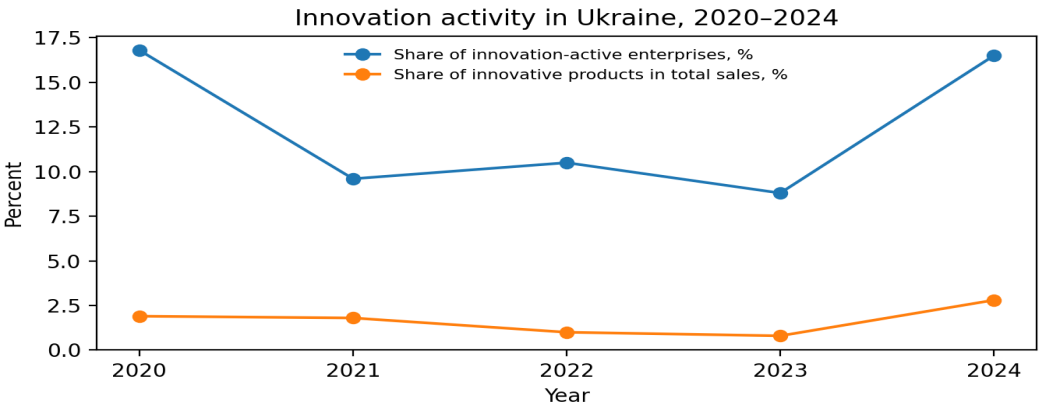

Fig. 2. **Innovation activity in Ukraine, 2020-2024**

Source: compiled by the author based on data from the State Statistic Service of Ukraine (State Statistic Service of Ukraine, 2025).

digital transformation of communities in the first quarter of 2025 amounted to only 16 points out of 100, while the weakest dimensions were digital infrastructure and the digital economy. By May 2025, the average level of digitalization of communities across regions was estimated at 30 points out of 100, with Dnipropetrovsk, Lviv, and Ternopil regions leading (Decentralization, 2025, May 14).

An empirical sign of a community's readiness for ecosystem-based development is the quality of governance, transparency, and the ability to work with data. According to the transparency ranking for 2024, the average transparency level of 100 Ukrainian cities was 41.6%; for large cities, the indicator was 59.1%, for medium-sized cities 41.7%, and for small cities only 33.2%. In this context, transparency, open data, and a community's digital profile function not merely as elements of good governance, but as direct determinants of innovation capacity because they support trust, investment communication, and evidence-based planning (Decentralization, 2025, May 25).

The fourth group of preconditions relates to the knowledge, education, and research base. According to the European Commission's 2025 report, Ukraine belongs to the group of emerging innovators and performs at only 29% of the EU average; expenditure on research and development in 2024 amounted to 0.37% of GDP, while cooperation between science and business remains underdeveloped. At the same time, Ukraine has an important internationalization potential: 225 Ukrainian institutions already participate in Horizon Europe projects, there is a network of 22 national contact points, and 35 Ukrainian higher education institutions are associated partners in European Universities Alliances (European Commission, 2025, Nov 04).

The situation is also reflected in the institutions responsible for the commercialization of knowledge. At the beginning of the 2024/2025 academic year, Ukraine had 314 higher education institutions, 316 research institutions, and 45 registered science parks. However, the total taxes paid by science parks in 2024 amounted to only UAH 7.8 million, while the Ministry of Education and Science has explicitly pointed to the weak development of this institution, low commercialization of research results, obsolete material and technical infrastructure, and the outflow of intellectual capital (Legislation of Ukraine, 2021, Sep 07).

This gap is clearly visible in the example of Lviv region. In 2024, the region had 19.3 thousand enterprises registered as legal entities, 94.4% of which were small enterprises; they employed 334.3 thousand people, and total sales reached

UAH 929.2 billion. At the same time, research and development activities involved 3.5 thousand employees, and R&D expenditure reached UAH 828.9 million. Yet even under these relatively strong conditions, the share of innovative products in total industrial sales was only 2.3%, while only 16.4% of surveyed industrial enterprises were innovation active. This indicates that even in stronger territories the main problem lies not in the absence of actors, but in the insufficient intensity of their cooperation and the weak conversion of knowledge into market results.

Any empirical analysis of communities in Ukraine currently faces methodological limitations. The assessment of communities' financial capacity for 2024 had to rely on verified population data as of 1 January 2022 adjusted for internally displaced persons, while the State Statistic Service of Ukraine resumed the labor force survey only in January 2026 after a four-year pause. As a result, the actual socio-demographic base of individual communities may differ from the formally recorded one, which means that the most accurate analysis of local innovation ecosystems should combine budget, digital, business, and project data with current local observations (Main Department of Statistics in Lviv Region, 2025).

Overall, the empirical preconditions for the emergence of innovation ecosystems of territorial communities in Ukraine are real but asymmetric. The best starting positions belong to urban and subregional communities that combine five features: fiscal capacity, a dense SME environment, digital maturity, the presence of educational and research institutions, and a higher level of governance transparency. For a significant share of settlement and rural communities, however, a network-based model of the innovation ecosystem is more realistic than an autonomous one, relying on cooperation with regional centres, universities, business hubs, donor programmes, and intermunicipal partnerships.

At the level of a territorial community, the innovation ecosystem is formed predominantly on the basis of endogenous potential: local enterprises, educational and research institutions, labour resources, and social initiatives. Unlike the macro level, where large-scale institutional programmes dominate, local ecosystems are oriented toward applied, incremental, and managerial innovations that directly affect economic activity and quality of life.

The innovation ecosystem of a territorial community includes local self-government bodies, local business (especially SMEs), educational and research centers, innovation infrastructure (clusters, business incubators, co-working spaces), and social networks and partnerships. In this context, the community acts as a space for the practical implementation of innovation, where technological and organizational solutions adapted to local needs and resource constraints can be tested.

An important feature of innovation ecosystems of territorial communities is their social orientation. Innovation is directed not only toward economic effects, but also toward the solution of problems related to employment, accessibility of services, environmental safety, and transparency of governance. In this sense, the community innovation ecosystem is closely connected with the concept of sustainable development.

The innovation ecosystem of a territorial community should therefore be formalized as an open multi-component system whose performance is determined not by separate elements in isolation, but by the interaction among them.

In general form, the model can be represented by the following function:

$$I_{ETC} = f(A, R, I, N, HC), \quad (1)$$

where I_{ETC} – the level of development of the innovation ecosystem of a territorial community; A – is the set of ecosystem actors; R – denotes the resources involved in the innovation process; I – is the institutional environment of the community; N – is the network of interactions and their intensity; and HC – is the community's human capital.

This is not a linear but a co-evolutionary model in which each variable is simultaneously a factor of ecosystem development and one of its results. For its practical application, the key components of the model should be structured as follows (Table 3).

Table 3

Key Components of the Innovation Ecosystem Model of a Territorial Community

Actor block (A)	Resource block (R)	Institutional block (I)	Network block (N)	Human capital (HC)
A = {B, S, E, L, C}	R = {F, K, T, INF, S}	I = {Reg, Gov, PPP, Dig}	$N=\sum_{i\neq j}^{n} wij \times \cdot Int_{ij}$	HC = f(Edu, Skills, Entre, Trust, Mob_t)
B – business (primarily SMEs) S – science and education E – innovation and digital infrastructure L – local self-government bodies C – civil society and social initiatives	F – financial resources (local budgets, grants, investments) K – knowledge and intellectual resources T – technologies and digital solutions INF – physical and innovation infrastructure S – social capital (trust, partnership)	Reg – local regulatory framework Gov – quality of local governance PPP – public-private partnership mechanisms Dig – digital tools for management and interaction	Int_{ij}– intensity of interaction between actors i and j w_{ij} – quality and stability of these ties	Edu – education and professional training level Skills – digital, managerial, and innovation competencies Entre – entrepreneurial activity Trust – level of trust and cooperation in the community Mob_t – migration balance of youth and specialists
Ecosystem outputs: Out = {Inno, Value, QoL, Sustain} Inno – innovation activity Value – locally created value added QoL – improvement in quality of life Sustain – long-term development resilience				

Source: compiled by the author.

To construct an integrated indicator of innovation ecosystem capacity, it is advisable to use a system of indicators for each block of the model (Table 4).

In the proposed model, human capital is not just one of the factors, but the core of the ecosystem that affects all other variables. Without a critical mass of human capital, no institutional or financial resource can be transformed into innovation outcomes at the community level.

A specific feature of territorial communities is that human capital performs not only an economic, but also a socio-institutional function: it shapes trust, a culture of cooperation, readiness for change, and openness to innovation. These intangible characteristics often compensate for deficits in financial and technological resources.

In addition, the quality of community human capital directly affects the ability of the community to integrate into regional and global innovation networks, the effectiveness of interaction among business, government, and civil society, the innovation activity of SMEs, and the capacity to attract investment and retain talent.

It is precisely the focus on human potential that allows communities to move from fragmented innovation initiatives to a coherent innovation-oriented economic ecosystem.

Table 4

Indicators for Assessing the Components of the Innovation Ecosystem Model of a Territorial Community

Model block	Component	Indicator
A – ecosystem actors	Business (B)	Number of SMEs in high-tech and creative sectors
		Share of innovation-active enterprises
	Science and education (S)	Number of HEIs, research institutes, and R&D centres
	Infrastructure (E)	Number of incubators, accelerators, technology parks, and hubs
	Local government (L)	Number of innovation programmes and projects implemented by local authorities
	Community (C)	Number of social and civic innovation initiatives
R – resource block	Finance (F)	Local budget financing of innovation
		Attracted grant and investment funds
	Knowledge and technology (K, T)	Number of patents, start-ups, or IT products
		Share of enterprises using digital platforms
	Infrastructure (INF)	Area of innovation infrastructure
		Access to broadband internet
		Number of co-working spaces, FabLabs, and data centres
	Social capital (S)	Number of business–education cooperation agreements
		Community participation in joint projects (proxy)
I – institutional block	Regulatory framework (Reg)	Availability and quality of an innovation strategy
	Governance (Gov)	Duration of administrative procedures
	Public-private partnership (PPP)	Number and value of PPP projects
	Digitalization (Dig)	Share of municipal e-services
	Transparency	Openness of budgetary and competitive procedures
N – network block	Interaction	Number of joint projects
		Average duration of partnerships
		Frequency of interactions (agreements, events, grants)
		Network density
		Index of cross-sectoral cooperation
HC – human capital	Education (Edu)	Share of population with higher education
	Skills	Share of employment in STEM, IT, and creative industries
	Entrepreneurship (Entre)	Start-ups per 10,000 population
	Trust	Level of trust in public authorities and partnerships
	Mobility (Mob_t)	Migration balance of youth and specialists

Source: compiled by the author on the basis of the author's own research.

The economic effectiveness of the innovation ecosystem of a territorial community is manifested, first of all, in greater entrepreneurial activity, stronger innovation capacity of SMEs, and the diversification of the local economic structure. As Lundvall notes, innovation development has a cumulative nature and is formed through local learning and interaction processes, which is particularly relevant for territorial communities (Lundvall, 2007).

The ecosystem of a community creates conditions for the diffusion of applied, organizational, and digital innovation with direct practical effects. In line with Adner's approach, ecosystem performance is determined by the ability to align the actions of interdependent actors in the process of value creation (Adner, Euchner, 2014).

As N. Etzkowitz and L. Leydesdorff emphasize, effective interaction among government, business, and science creates the preconditions for socially meaningful innovation (Etzkowitz, 2021; Leydesdorff, 2016). At the community level, this interaction is complemented by the active participation of civil society, which enhances the social impact of innovation activity (Cooke, 2025).

A key long-term result of the functioning of the community innovation ecosystem is the reproduction and development of human capital. Following H. Becker's classical concept, investment in education and skills is a decisive factor of economic growth (Gonzalez, Morejyn, 2022). At the local level, human capital also plays a socio-institutional role by shaping trust, cooperation, and readiness for innovation.

As S. Lucas points out, the concentration of human capital ensures the endogenous development of territories. In the context of innovation ecosystems of territorial communities, this means the ability not only to generate innovation, but also to attract and retain talent, which is critical for sustainable development (Sasmal, 2023).

The performance of the innovation ecosystem of a territorial community should therefore be interpreted as a multidimensional integrated outcome generated by the interaction of economic, social, institutional, and human factors. Unlike national and regional innovation systems, where performance is often identified with macroeconomic indicators or technological breakthroughs, the key issue at the local level is the combination of economic effect with higher quality of life and stronger institutional capacity.

Conclusions and Directions for Further Research

The article substantiates the relevance of applying the ecosystem approach to the study of innovation development in territorial communities. It demonstrates that the classical concepts of the innovation system and the innovation cluster have limited explanatory potential with regard to local innovation processes because they do not fully account for cross-sectoral interaction, social factors, and the role of local self-government.

It is proved that the innovation ecosystem of a territorial community is an open and dynamic system formed on the basis of network interaction among business, the scientific and educational sector, local self-government bodies, civil society, and infrastructure institutions. The proposed formalized model makes it possible to combine the actor, resource, institutional, and network components of the ecosystem within a single analytical framework while identifying human capital as its system-forming core.

The article distinguishes the main dimensions of the performance of innovation ecosystems in territorial communities, including economic, innovation-technological, social, institutional-managerial, and human-capital dimensions. The key effect of ecosystem functioning lies not only in better economic indicators, but also in the qualitative transformation of local development, stronger innovation capacity, and a higher quality of life.

Further research should focus on the empirical measurement of the performance of innovation ecosystems of territorial communities, the analysis of local self-government's institutional capacity as a facilitator of innovation, and the mechanisms through which local ecosystems can be integrated into regional and global innovation networks.

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Тимкович О. І. Структура та характеристики інноваційних екосистем територіальних громад

Мета. *Метою статті є теоретичне обґрунтування сутності, структури та ключових характеристик інноваційних екосистем територіальних громад, а також визначення особливостей взаємодії їх основних акторів, ресурсних, інституційних і мережевих компонентів у контексті підвищення інноваційної спроможності та конкурентоспроможності громад в умовах децентралізації, цифрової трансформації й посилення глобальної конкуренції.*

Методологія. *Методологічною основою дослідження є екосистемний, системний, структурно-функціональний та порівняльний підходи. У роботі використано методи теоретичного узагальнення, наукової абстракції, порівняльного аналізу, структуризації та формалізації.*

Результати. *У статті доведено, що класичні моделі інноваційної системи та інноваційного кластера мають обмежену пояснювальну спроможність щодо локальних інноваційних процесів, оскільки недостатньо враховують міжсекторальний характер взаємодії, соціальний вимір інновацій та фасилітаційну роль місцевого самоврядування. Обґрунтовано, що інноваційна екосистема територіальної громади є відкритою, динамічною та коеволюційною системою, у межах якої взаємодіють бізнес, науково-освітній сектор, органи місцевого самоврядування, громадянське суспільство та інфраструктурні інституції.*

Оригінальність. *Наукова новизна дослідження полягає в поглибленні теоретичних засад екосистемного підходу до аналізу інноваційного розвитку територіальних громад, обґрунтуванні авторського трактування інноваційної екосистеми громади та розробленні формалізованої багатокомпонентної моделі її функціонування.*

Практична цінність. *Практичне значення одержаних результатів полягає в можливості використання запропонованих теоретичних положень, структурної моделі та системи індикаторів під час формування місцевої економічної політики, стратегій інноваційного розвитку територіальних громад, програм підтримки підприємництва, розвитку людського капіталу та цифрової інфраструктури. Результати дослідження можуть бути застосовані органами місцевого самоврядування і розробниками регіональних і місцевих програм для підвищення інституційної спроможності громад і посилення їхніх конкурентних позицій.*

Ключові слова: *регіональний розвиток, інноваційна екосистема, територіальна громада, людський капітал, інноваційний розвиток, мережева взаємодія, конкурентоспроможність.*

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