GLOBAL MODELS OF ENTREPRENEURIAL ECOSYSTEMS AND THEIR ADAPTATION TO MAHALLA-LEVEL DEVELOPMENT: A COMPARATIVE ANALYSIS

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Abstract. This article provides a comparative analysis of the principal models used in international practice to conceptualize and develop entrepreneurial ecosystems and evaluates their applicability to the mahalla, Uzbekistan's community-level institution. The study synthesizes the entrepreneurial ecosystem approach, national and regional innovation systems, Triple–Quadruple–Quintuple Helix models, cluster and local economic development theories, inclusive and community-based entrepreneurship, and the Smart Territory/Smart Village concept. The analysis shows that no single model fully captures the economic, institutional, social, spatial, and digital dimensions of entrepreneurship at the neighborhood level. Accordingly, the article proposes an integrated framework combining ecosystem interdependence, multi-actor governance, community participation, local specialization, inclusion, and digital coordination. International experiences—including Finland's startup communities, the United Kingdom's local partnerships, South Korea's Saemaul Undong, Thailand's One Tambon One Product programme, and the European Union's Smart Villages initiative—are examined to identify transferable mechanisms. The paper concludes with an authorial definition of a mahalla entrepreneurial ecosystem and outlines practical principles for adapting global models to Uzbekistan's institutional environment.

Keywords: entrepreneurial ecosystem, mahalla, local economic development, Quadruple Helix, community-based entrepreneurship, Smart Village, digital governance, Uzbekistan.

1. Introduction

Entrepreneurship is increasingly understood not as the isolated activity of individual firms, but as the outcome of a complex environment in which institutions, finance, knowledge, infrastructure, culture, networks, and public policy interact. This systemic interpretation is particularly important for developing economies, where entrepreneurial opportunities are strongly shaped by the quality of local institutions and by the ability of public, private, and community actors to coordinate their decisions. The entrepreneurial ecosystem perspective therefore shifts analytical attention from individual enterprises to the relationships and resource flows that enable entrepreneurial activity to emerge, survive, and scale.

The relevance of this perspective is especially high at the mahalla level. In Uzbekistan, the mahalla is not merely a territorial unit; it is also a community institution that connects households, local government, social organizations, and economic actors. This proximity to citizens creates opportunities for identifying entrepreneurial potential, targeting support instruments, mobilizing local resources, and building trust-based cooperation. At the same time, mahallas differ significantly in human capital, infrastructure, specialization, market access, and digital readiness. Consequently, international entrepreneurial ecosystem models cannot be transferred mechanically. They require institutional adaptation and a careful combination of complementary elements.

The purpose of this article is to compare the main entrepreneurial ecosystem models used in global practice, identify their strengths and limitations at the mahalla level, and develop an integrated conceptual approach suitable for local development in Uzbekistan. The study uses comparative institutional analysis and conceptual synthesis. It draws on the source literature on entrepreneurial ecosystems, innovation systems, multi-helix models, local economic development, inclusive entrepreneurship, and smart rural development. The contribution of the article lies in linking these strands to the specific governance and community features of the mahalla institution.

2. Theoretical Foundations of Entrepreneurial Ecosystems

The Entrepreneurial Ecosystem Approach is based on the interdependence of actors and conditions that jointly influence entrepreneurship. Its key premise is that productive entrepreneurship cannot be created by a single policy instrument. Access to finance without skills, infrastructure without markets, or business registration reform without trust and coordination will produce limited results. Cao and Shi (2021) demonstrate that the performance of entrepreneurial ecosystems in emerging economies is closely related to the maturity of the institutional environment. This conclusion is particularly relevant to resource-constrained localities, where weak coordination can prevent available resources from being converted into entrepreneurial outcomes.

National and Regional Innovation System approaches place knowledge creation, technological learning, and innovation diffusion at the center of economic development. Universities, research institutions, firms, government agencies, and intermediary organizations form networks through which knowledge and technology circulate. Their strength is the ability to explain innovation capacity and technological upgrading. However, these models were mainly developed for national and regional scales. At the mahalla level, formal research organizations may be absent, and innovation often takes the form of incremental improvements, digital adoption, new business models, or the commercialization of local skills. Therefore, innovation-system logic should be simplified and localized through links with nearby universities, vocational institutions, business support centers, and digital platforms.

Triple, Quadruple, and Quintuple Helix models extend the innovation-system perspective by emphasizing cooperation among government, business, universities, civil society, and, in the Quintuple Helix, the natural environment. Cai and Lattu (2022) show that the choice between Triple and Quadruple Helix models depends on the research and policy context, while the inclusion of civil society is essential when innovation is expected to

respond to community needs. This feature is highly compatible with the mahalla, where community participation, social trust, and local leadership can influence whether development programs are accepted and implemented effectively. The Quintuple Helix additionally introduces environmental sustainability, which is important for green entrepreneurship, energy efficiency, waste management, and climate-resilient local production.

Cluster theory and Local Economic Development (LED) focus on spatial proximity, specialization, supplier relationships, labor-market linkages, and competitive advantage. These approaches are useful for identifying local production niches and organizing cooperation among small firms. A mahalla or a group of neighboring mahallas may develop around handicrafts, food processing, services, logistics, tourism, textiles, or home-based production. Nevertheless, cluster models can understate social inclusion, informal networks, and the role of local public institutions. For this reason, cluster-based specialization should be embedded within a broader ecosystem framework.

Inclusive entrepreneurial ecosystems and Community-Based Entrepreneurship emphasize broad participation, especially among women, young people, low-income households, persons with disabilities, and other groups that may face barriers to finance, skills, networks, or markets. Roundy and Lyons (2021) call for greater attention to the micro-foundations and strategic organization of entrepreneurial ecosystems, highlighting the role of actual entrepreneurs and community actors rather than treating the ecosystem as an abstract structure. At the mahalla level, inclusion is not only a social objective; it expands the local entrepreneurial base, diversifies income sources, and strengthens resilience.

Finally, the Smart Territory and Smart Village concepts integrate digital technologies with place-based development. Digital platforms can improve access to public services, training, finance, procurement, logistics, and markets. However, smart development is not synonymous with technology alone. European Smart Village initiatives emphasize that digital tools must be combined with local knowledge, community participation, and context-sensitive governance. Thus, digitalization should function as an enabling layer connecting ecosystem actors rather than as an isolated infrastructure project.

3. Comparative Assessment of the Main Models

Table 1 summarizes the analytical focus, principal strengths, and limitations of the main approaches when applied to mahalla-level entrepreneurial development. The comparison confirms that each model illuminates a different dimension of the local economy, but none is sufficient on its own.

Table 1. Comparative Characteristics of Entrepreneurial Ecosystem Models

Approach	Core idea	Main strength	Mahalla-level limitation	Most useful local application
Entrepreneurial Ecosystem	Interdependence among actors,	Provides a holistic view of entrepreneurial	Requires extensive information	Mapping actors, resource flows, gaps, and

Approach	Core idea	Main strength	Mahalla-level limitation	Most useful local application
	institutions, resources, and networks	development	and strong coordination	support mechanisms
National/Regional Innovation System	Exchange of knowledge, technology, and innovation	Strengthens learning, innovation, and technological capacity	Primarily designed for macro and meso levels	Connecting mahallas with universities, training centers, and innovation services
Triple/Quadruple/Quintuple Helix	Cooperation among government, business, academia, civil society, and environment	Captures multi-actor governance and societal participation	Requires institutional maturity and clear role allocation	Local partnership councils and joint problem-solving platforms
Cluster / Local Economic Development	Territorial proximity, specialization, and value-chain linkages	Builds competitiveness, economies of agglomeration, and local brands	May insufficiently address inclusion and institutional trust	Specialized micro-clusters and inter-mahalla value chains
Inclusive / Community-Based Entrepreneurship	Broad participation and collective use of local assets	Fits the social structure of the mahalla and expands opportunity	Highly dependent on facilitation, resources, and sustained participation	Women's and youth entrepreneurship, cooperatives, social enterprises
Smart Territory / Smart Village	Digital integration of services, actors, information, and markets	Improves transparency, reach, coordination, and access to markets	Depends on connectivity, digital literacy, cybersecurity, and data	Digital one-stop services, e-commerce, e-learning, local data dashboards

Approach	Core idea	Main strength	Mahalla-level limitation	Most useful local application
			quality	
Integrated Mahalla Ecosystem	Combination of systemic, participatory, specialized, inclusive, and digital elements	Balances economic efficiency with social legitimacy and local adaptability	More complex to design, monitor, and govern	A place-based development model tailored to each mahalla's assets and constraints

The comparative assessment leads to three conclusions. First, ecosystem and helix approaches are strongest in explaining coordination and interdependence, while cluster and LED approaches are more effective for identifying economic specialization. Second, inclusive and community-based models supply the social foundation required for legitimacy, participation, and broad access to opportunity. Third, Smart Territory approaches provide the digital infrastructure for information exchange and service delivery. An effective mahalla model must therefore combine these strengths while avoiding excessive institutional complexity.

4. International Practices and Transferable Lessons

International practice offers multiple examples of how local entrepreneurial ecosystems can be organized. Their value lies not in direct replication but in identifying mechanisms that can be adapted to different institutional settings. Finland's startup communities illustrate the importance of bringing entrepreneurs, investors, universities, mentors, and service providers into a shared innovation environment. The critical lesson is not the physical "village" itself, but the density of interaction, the accessibility of expertise, and the speed with which ideas can be connected to finance and markets.

The United Kingdom's Local Enterprise Partnerships were created as business-led partnerships involving local authorities and other stakeholders. Their experience demonstrates the potential of territorially focused cooperation for aligning business needs, skills policies, infrastructure priorities, and economic development strategies. It also shows that partnership bodies need stable mandates, transparent accountability, and integration with democratic local institutions. For mahallas, the relevant principle is the creation of a compact coordination mechanism rather than a large new bureaucracy.

South Korea's Saemaul Undong movement is widely associated with community mobilization, self-help, cooperation, and improvements in local living and production conditions. Its transferable value lies in activating local initiative and shared responsibility. However, contemporary adaptation should avoid command-style mobilization and instead rely on voluntary participation, transparent incentives, measurable projects, and inclusive decision-making. In the mahalla context, this could support community-based infrastructure, cooperative services, and joint business initiatives.

Thailand's One Tambon One Product programme demonstrates how local identity, skills, and raw materials can be transformed into marketable products through quality improvement, branding, training, and market access. For Uzbekistan, a similar principle can support mahalla-level specialization in handicrafts, food products, garments, tourism services, and creative industries. The key requirement is to move beyond production subsidies toward a complete value chain that includes standards, packaging, digital marketing, logistics, and customer feedback.

The European Union's Smart Villages initiative is particularly relevant because it combines digitalization with community-led development. Smart Villages are not defined solely by broadband or digital devices; they use innovation and technology to address locally identified economic and social needs. This includes remote services, digital skills, e-commerce, shared mobility, renewable energy, and data-supported governance. Such an approach offers a methodological basis for building a digital entrepreneurial ecosystem at the mahalla level.

5. Adaptation to the Mahalla Context in Uzbekistan

The adaptation of international models should begin with recognition of the mahalla's dual nature as both a territorial community and an institutional interface between citizens and the state. This creates a comparative advantage in information: local leaders and residents often possess detailed knowledge about household skills, unused premises, informal production, social constraints, and emerging business ideas. The challenge is to transform this dispersed knowledge into transparent, rights-based, and economically productive support mechanisms.

An integrated mahalla entrepreneurial ecosystem can be organized around six functional components. The first is entrepreneurial actors: microenterprises, self-employed persons, family businesses, startups, cooperatives, and potential entrepreneurs. The second is institutions and governance: mahalla bodies, local government, business associations, financial institutions, tax and registration services, and community organizations. The third is finance: microcredit, bank lending, guarantees, grants, equity or quasi-equity instruments, and community co-financing. The fourth is human capital: vocational skills, business literacy, mentoring, digital competence, and managerial capacity. The fifth is infrastructure and market access: premises, utilities, transport, logistics, procurement, retail channels, and e-commerce. The sixth is the digital environment, which connects data, services, learning, finance, and markets.

The ecosystem should operate through continuous resource and information flows rather than isolated programs. A potential entrepreneur may first be identified through a local skills and needs assessment, then receive training and mentoring, gain access to a digital business profile, apply for suitable finance, connect with suppliers and buyers, and receive post-financing support. The quality of the ecosystem depends on whether these stages are coordinated. Fragmented assistance can create formal business registrations without sustainable activity, whereas an integrated pathway increases survival, productivity, and growth.

Adaptation also requires differentiation. Mahallas should not all receive the same policy package. A typology may distinguish urban service-oriented mahallas, industrial or logistics

mahallas, rural agricultural mahallas, tourism and handicraft mahallas, and socially vulnerable mahallas with limited infrastructure. Each type requires different combinations of training, finance, infrastructure, digital tools, and market linkages. This place-based approach is more efficient than uniform support because it aligns policy with local assets and constraints.

Digital governance can strengthen this model through a mahalla entrepreneurial dashboard that consolidates non-sensitive indicators on business activity, employment, skills, financing needs, available premises, infrastructure bottlenecks, and market opportunities. Such a dashboard should not become a mechanism of excessive surveillance or administrative pressure. Its purpose should be service coordination, evidence-based decision-making, and public accountability. Data protection, consent, cybersecurity, and clear institutional responsibility are therefore essential.

6. Authorial Definition and Integrated Conceptual Model

Based on the synthesis of theoretical approaches and international practice, the following authorial definition is proposed: a mahalla entrepreneurial ecosystem is an interconnected, place-based system of entrepreneurs, public and community institutions, financial organizations, infrastructure, human capital, social networks, and digital platforms operating within or serving a particular mahalla, through which resources, information, knowledge, and financial flows are coordinated to ensure inclusive, innovative, and sustainable entrepreneurial development.

The scientific significance of this definition is that it treats the mahalla entrepreneurial ecosystem not as a collection of organizations or support programs, but as a system of economic, social, institutional, and informational relationships. Its performance should therefore be evaluated not only by the number of registered enterprises or loans issued, but also by the quality of cooperation, continuity of support, speed of information exchange, accessibility of services, business survival, employment quality, innovation, market expansion, and the inclusion of underrepresented groups.

The proposed integrated model combines five principles. First, systemic interdependence: every support instrument must be linked to complementary resources and institutions. Second, multi-actor governance: public agencies, businesses, educational institutions, financial organizations, and community representatives should participate in problem-solving. Third, place-based specialization: support should build on local assets and value-chain opportunities. Fourth, inclusion and community ownership: women, youth, low-income households, and other groups must have real access to participation and benefits. Fifth, digital enablement: technology should reduce transaction costs, expand markets, improve transparency, and support evidence-based coordination.

7. Policy and Management Implications

For practical implementation, local policy should shift from counting support measures to measuring entrepreneurial outcomes. The number of training participants, loans, or newly registered firms is informative but insufficient. A balanced monitoring system should include business survival after one and three years, employment created, revenue growth,

productivity, repayment performance, export or interregional sales, participation of women and youth, digital adoption, and satisfaction with support services.

Institutional design should remain lean. Rather than creating a new organization for every function, a mahalla ecosystem coordinator or small coordination group can connect existing institutions and maintain a common action plan. Its responsibilities may include ecosystem mapping, referral of entrepreneurs to services, monitoring of bottlenecks, organization of partnership meetings, and collection of feedback. Decision-making criteria for finance and support should be transparent to prevent favoritism and strengthen trust.

Local entrepreneurial development should also be connected to district, regional, and national systems. A mahalla cannot independently provide advanced finance, export certification, research services, or complex logistics. Its role is to identify potential, organize initial support, and connect entrepreneurs to higher-level institutions. In this sense, the mahalla is the entry point and coordination node of a multi-level entrepreneurial ecosystem rather than a self-contained economic unit.

8. Conclusion

The comparative analysis demonstrates that global models of entrepreneurial ecosystems offer complementary rather than mutually exclusive explanations of local entrepreneurial development. The Entrepreneurial Ecosystem Approach provides a systemic framework; innovation systems highlight knowledge and technology; Helix models emphasize multi-actor cooperation; cluster and LED theories identify specialization and value-chain opportunities; inclusive and community-based approaches ensure broad participation; and Smart Territory concepts supply the digital layer for coordination and market access.

For mahalla-level development in Uzbekistan, the most appropriate solution is an integrated model that combines these elements in a place-based and institutionally realistic manner. International experience suggests that successful local ecosystems rely on dense networks, community ownership, clear partnership mechanisms, local branding, access to skills and finance, and digital tools that respond to actual needs. The mahalla institution provides a promising platform for such integration because of its proximity to citizens and its capacity to connect social and economic policy.

Future empirical research should test the proposed framework across different types of mahallas and develop a measurable index of ecosystem maturity. Such an index could assess institutional coordination, finance, human capital, infrastructure, market connectivity, inclusion, digital readiness, and entrepreneurial outcomes. This would make it possible to compare territories, identify bottlenecks, and design differentiated policy packages based on evidence rather than uniform administrative targets.

References

1. Cao, Z., & Shi, X. (2021). A systematic literature review of entrepreneurial ecosystems in advanced and emerging economies. Small Business Economics, 57, 75–110. https://doi.org/10.1007/s11187-020-00326-y

2. Cai, Y., & Lattu, A. (2022). Triple Helix or Quadruple Helix: Which model of innovation to choose for empirical studies? Minerva, 60, 257–280. https://doi.org/10.1007/s11024-021-09453-6
3. Roundy, P. T., & Lyons, T. S. (2021). Where are the entrepreneurs? A call to theorize the micro-foundations and strategic organization of entrepreneurial ecosystems. Strategic Organization.
4. Visvizi, A., Lytras, M. D., & Mudri, G. (2019). Smart villages: Relevance, approaches, policymaking implications. In A. Visvizi, M. D. Lytras, & G. Mudri (Eds.), Smart Villages in the EU and Beyond (pp. 1–12). Emerald Publishing.
5. Isenberg, D. J. (2011). The entrepreneurship ecosystem strategy as a new paradigm for economic policy: Principles for cultivating entrepreneurship. Babson Entrepreneurship Ecosystem Project, Babson College. https://www.innovationamerica.us/images/stories/2011/The-entrepreneurship-ecosystem-strategy-for-economic-growth-policy-20110620183915.pdf
6. Stam, E. (2015). Entrepreneurial ecosystems and regional policy: A sympathetic critique. European Planning Studies, 23(9), 1759–1769. https://doi.org/10.1080/09654313.2015.1061484
7. OECD. (2015). Employment and Skills Strategies in England, United Kingdom. OECD Reviews on Local Job Creation. OECD Publishing. https://doi.org/10.1787/9789264228078-en
8. OECD. (2021). Local entrepreneurship ecosystems and emerging industries: Case study of Cambridgeshire and Peterborough, United Kingdom. OECD Local Economic and Employment Development (LEED) Papers. https://doi.org/10.1787/044ffc1d-en
9. European Commission. (2018). EU support for Smart Villages. Shaping Europe's Digital Future. https://digital-strategy.ec.europa.eu/en/library/eu-support-smart-villages