

Inclusive Globalization and Collaborative Innovation as Drivers of Rural MSME Development in India: Challenges, Strategies and Pathways

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Abstract: Rural Micro, Small and Medium Enterprises (MSMEs) are a vital component of India's development, contributing around 30% to GDP, 45% to exports and supporting over 110 million livelihoods, while promoting traditional skills and rural employment across sectors like handicrafts, agro-processing and tourism; however, their growth is constrained by challenges such as poor infrastructure, limited credit access, digital divides and weak market linkages. This paper examines how inclusive globalization and collaborative innovation can address these barriers through a descriptive-analytical approach based on secondary data and case studies, arguing that their convergence—supported by enabling policies, digital infrastructure and multi-stakeholder partnerships—is essential for transforming rural MSMEs into globally competitive enterprises. Evidence from initiatives like the Pochampally Ikat cluster, Moradabad brassware industry, Palash Scheme in Jharkhand and IIT Madras incubation models demonstrates the role of cluster development, public-private partnerships and digital platforms, while the paper concludes by proposing a strategic roadmap focused on smart villages, green infrastructure and entrepreneurship, aligned with the goals of Atmanirbhar Bharat and the Sustainable Development Goals.

Keywords: rural MSMEs; inclusive globalization; collaborative innovation; sustainable development; digital transformation; cluster development; India

1. Introduction

The global economy is undergoing a period of accelerated transformation, driven by digitalization, shifting trade architectures and growing emphasis on sustainable and inclusive development. Within this context, Micro, Small and Medium Enterprises (MSMEs) — particularly those operating in rural regions — occupy a paradoxical position: they are simultaneously among the most critical contributors to national economies and among the most structurally vulnerable to global competitive pressures.

In India, MSMEs represent a vast and heterogeneous sector. As per the revised classification introduced under the Atmanirbhar Bharat Abhiyan (2020), a Micro Enterprise is defined by investment up to ₹1 crore and turnover up to ₹5 crore; a Small Enterprise by investment up to ₹10 crore and turnover up to ₹50 crore; and a Medium Enterprise by investment up to ₹50 crore and turnover not exceeding ₹250 crore (Ministry of MSME, 2020). Of India's estimated 63 million MSMEs, over half operate in rural areas, spanning handicrafts, agro-processing, textiles, renewable energy and rural tourism (Economic Survey of India, 2024–25).

Globally, definitional frameworks vary. The United

Nations, through UNIDO and UNCTAD, uses employment size — with Micro Enterprises employing fewer than 10 persons, Small Enterprises between 10 and 49 and Medium Enterprises between 50 and 249 (UNCTAD, 2022). The World Bank integrates both employment and financial parameters, recognising Medium Enterprises as those employing up to 299 persons with assets or sales between USD 3 million and USD 15 million (World Bank, 2023). These definitional variations reflect the diversity of national contexts while underscoring the universal recognition of MSMEs as engines of economic and social development.

The Government of India has pursued an ambitious agenda to transform rural MSMEs through a suite of policy interventions — including Digital India, Bharat Net, MUDRA Yojana, PMEGP and the Pradhan Mantri Employment Generation Programme — while embedding MSME development within broader national visions such as Make in India, Atmanirbhar Bharat and Viksit Bharat 2047. The Economic Survey 2024–25 highlights rural development as a strategic priority, with record Kharif foodgrain production and substantial progress under PM Awas Yojana-Gramin and PM Fasal Bima Yojana (Ministry of Finance, 2025).

Despite this momentum, structural gaps persist. This paper asks: under what conditions can inclusive globalization and collaborative innovation serve as durable drivers of rural MSME development? The paper proceeds as follows: Section 2 reviews the theoretical and empirical literature. Section 3 outlines the research methodology. Section 4 analyses the pathways through which globalization and collaborative innovation impact rural MSMEs. Section 5 presents case studies of transformative practice. Section 6 examines persistent challenges. Section 7 discusses enabling policy frameworks. Section 8 identifies research and policy gaps and proposes a future outlook. Section 9 concludes.

2. Literature Review

The relationship between globalization and small enterprise development has attracted substantial scholarly attention. Porter (1990), in his influential framework of competitive advantage, argued that the clustering of related industries within geographic regions generates the conditions for sustained innovation and international competitiveness — a thesis directly applicable to rural MSME clusters. Subsequent work by Pyke and Sengenberger (1992) on industrial districts reinforced the view that small firm networks can overcome scale disadvantages through collective efficiency, provided institutional support structures are in place.

In the context of developing economies, Schmitz (1995) introduced the concept of "collective efficiency" to explain how MSME clusters in Brazil and other emerging markets achieved global competitiveness through joint action and external economies. This work laid the theoretical foundation for cluster-based development policies that India has since institutionalised through the Micro and Small Enterprises – Cluster Development Programme (MSE-CDP). More recently, Giuliani, Pietrobelli and Rabellotti (2005) examined how participation in global value chains affects knowledge upgrading in MSME clusters, finding that the nature of governance within chains — captive, modular or relational — significantly determines the extent of knowledge transfer and capability development.

On collaborative innovation, Chesbrough (2003) articulated the "open innovation" paradigm, arguing that firms that draw on external knowledge sources — universities, startups, government agencies and customers — innovate more effectively than those relying on internal R&D alone. This framework has particular relevance for resource-constrained rural MSMEs that cannot sustain in-house innovation capacities. The Triple Helix model proposed by Etzkowitz and Leydesdorff (2000) further theorises the

productive interaction between universities, industry and government as the basis for knowledge-based regional development — a model increasingly reflected in India's Rural Technology Business Incubator (RTBI) framework.

In the Indian context, Kathuria, Raj and Sen (2010) documented the divergence in MSME performance between formal and informal sectors, finding that access to credit, technology and skilled labour — rather than market size — were the primary determinants of productivity. Subrahmanya (2017) examined the role of innovation in Indian MSMEs and found that while product and process innovation was positively associated with export performance, the majority of small enterprises lacked the absorptive capacity to leverage external knowledge sources without institutional mediation. These findings underscore the importance of collaborative and intermediary mechanisms in translating the potential of globalization into tangible outcomes for rural enterprises.

The literature on digital transformation and MSMEs is more recent but rapidly expanding. Nambisan (2017) argued that digital technologies fundamentally alter the locus, process and outcomes of entrepreneurial action by enabling platform-based value creation that transcends geographic boundaries. For rural MSMEs, platforms such as ONDC (Open Network for Digital Commerce), the Government e-Marketplace (GeM) and UPI-based payment systems represent precisely this kind of boundary-dissolving infrastructure. However, as Venkatesh, Thong and Xu (2012) caution, technology adoption is contingent on perceived usefulness, ease of use and social influence — factors that must be addressed through digital literacy and capacity-building programmes for rural populations.

A review of the literature reveals a significant gap: while studies examine either globalization or innovation as separate drivers of MSME development, there is limited systematic analysis of their interaction — specifically, how collaborative innovation enables rural MSMEs to leverage globalization opportunities while managing competitive risks. This paper seeks to address this gap.

3. Research Methodology

This paper adopts a descriptive-analytical research design, drawing exclusively on secondary data sources. The methodology is appropriate given the paper's objective of synthesising evidence across policy, empirical and institutional domains to develop a conceptual framework for rural MSME development under conditions of inclusive globalization and collaborative innovation.

Data sources include: (i) official government reports and

economic surveys, including the Economic Survey of India (2024–25), Annual Reports of the Ministry of MSME (2022–23, 2023–24) and reports from SIDBI and the National Statistical Office; (ii) institutional databases from the World Bank, UNCTAD, UNIDO and the OECD; (iii) peer-reviewed academic literature identified through a systematic review of databases including Scopus, JSTOR and Google Scholar using search terms such as "rural MSMEs India", "inclusive globalization developing economies", "collaborative innovation clusters" and "digital transformation small enterprises"; and (iv) published case studies from government scheme documentation, MSME cluster reports and accredited institutional evaluations.

The analysis proceeds through three stages: (1) a thematic review of the literature and policy context to identify key drivers and barriers; (2) a cross-case analysis of four rural MSME case studies to identify patterns of successful intervention; and (3) a synthesis of gaps and strategic priorities based on comparative analysis of empirical evidence and policy frameworks. Interpretive validity is strengthened by triangulating across multiple data sources, while the focus on secondary data introduces limitations in terms of the currency and granularity of enterprise-level evidence — a constraint acknowledged in Section 8.

4. Pathways for Rural MSME Development: Globalization and Collaborative Innovation

4.1 Inclusive Globalization : Conceptual Framework

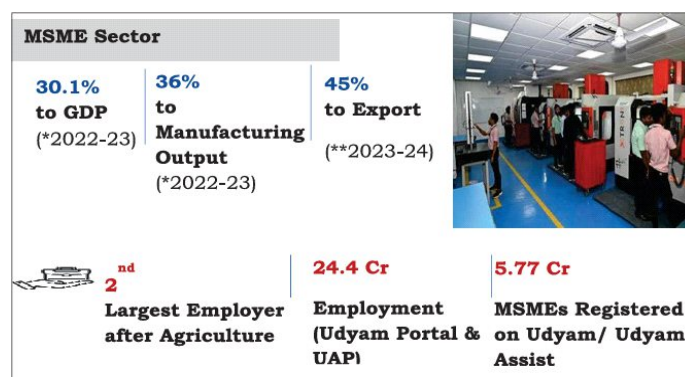
Inclusive globalization refers to the deliberate design of global economic integration processes such that their benefits extend to historically marginalised actors — rural communities, micro-enterprises and informal economy participants — and not merely to large corporations and urban centres (UNCTAD, 2022). It involves expanding market access, enabling technology transfer, facilitating knowledge flows and ensuring that trade and investment frameworks are calibrated to the absorptive capacity of small and rural enterprises. A comparative overview of MSME classification frameworks is presented in Figure 1.

For Indian rural MSMEs, inclusive globalization operates through several channels. First, integration into global value chains (GVCs) connects rural producers to international buyers, enabling access to larger consumer bases through exports, e-commerce platforms and cross-border trade. Such integration stimulates production, creates employment,

enhances household incomes and reduces pressures of rural-to-urban migration (Giuliani et al., 2005). Second, globalization facilitates technology and knowledge transfer, exposing rural enterprises to advanced production methods, quality certification processes and modern managerial practices. Third, rising global demand for authentic, handmade and environmentally responsible products creates niche opportunities for cultural and indigenous branding, enabling rural MSMEs to position traditional skills in premium global market segments.

The global MSME landscape underscores the stakes of this integration. MSMEs constitute over 90 percent of businesses worldwide and provide more than 50 percent of employment globally (World Bank, 2023). India's performance in comparison to peer economies reflects both the scale of the opportunity and the depth of the challenge (see Table 1).

Figure 1: MSME Classification Framework — India and International Comparators



Source: Ministry of MSME (2020); World Bank (2023); UNCTAD (2022).

4.2 Collaborative Innovation: Mechanisms and Modalities

Collaborative innovations may be understood as the co-creation of products, services, business models or systems through the collective efforts of diverse actors — enterprises, governments, academic institutions, civil society organisations and local communities (Chesbrough, 2003). Unlike isolated innovation, collaborative models harness complementary strengths — knowledge, capital, technology and infrastructure — to generate outcomes that are otherwise unattainable by individual actors operating independently.

In the context of rural development and MSME growth, collaborative innovation manifests in several distinct modalities. Cluster-based development fosters economies of scale by concentrating firms in related industries, enabling shared infrastructure, logistics and technological support.

Public–private partnerships (PPPs) bridge infrastructure and technology gaps through co-investment and risk sharing. Digital marketplaces connect rural producers directly to global consumers, eliminating dependence on intermediaries. Cooperative associations and self-help groups (SHGs) strengthen collective bargaining power and generate economies of scale. Cross-sectoral alliances between industry, academia and government promote sustainable practices and value-chain integration aligned with international standards (Etzkowitz & Leydesdorff, 2000).

Together, these mechanisms enable rural MSMEs to overcome the structural barriers — limited resources, inadequate infrastructure and restricted market access — that constrain individual enterprise growth. The synergy between globalization and collaborative innovation is illustrated in Figure 2.

Table 1: Performance Comparison of India's MSMEs with Selected Economies

MSME obstacles/challenges	India	South Asia	All countries
Biggest Obstacle	Access to Financial Sources (21.5%)	Political Instability (17.9%)	Access to Financial Sources (15.3%)
Gender Representation (enterprises having female ownership participation) (%)	3.9	13.8	32.9
Annual Labour Productivity Growth (%)	-4.3	-3.1	-2.8
Real annual sales growth (%)	-1.5	0.8	0.7
Innovation and Technology firms globally introduce new products or services (%)	5.8	24.9	36
Customs (number of days to clear direct exports & imports from customs)	Exports-17.3 Imports-31.5	Exports-12 Imports-7.4	Expots-14.1 Imports-12.3

Source: Ministry of MSME Annual Report (2023); World Bank Enterprise Survey (2023).

4.3 Transformative Impacts

The convergence of inclusive globalization and collaborative innovation generates several categories of transformative impact for rural MSMEs. In terms of market access and economic growth, integration into global networks enables rural enterprises to diversify their customer base, access higher-value market segments and reduce dependence on volatile local demand. Exports from MSME clusters such as Pochampally, Moradabad and Vazhakulam demonstrate that globally integrated rural enterprises achieve significantly higher revenue growth than locally confined counterparts.

In terms of technology adoption and knowledge

upgrading, collaborative mechanisms — particularly PPPs and university–industry linkages — accelerate the diffusion of appropriate technologies into rural production systems. AI-driven analytics assist businesses in understanding international consumer behaviour and optimising pricing; IoT-enabled monitoring ensures quality control and efficient inventory management; and advanced logistics solutions reduce delivery delays and operational costs (Nambisan, 2017).

In terms of sustainability and cultural preservation, global demand for eco-certified, ethically produced and geographically indicated products creates incentives for MSMEs to adopt environmentally responsible production processes. Collaborative innovation reinforces this by encouraging renewable energy use, waste reduction and socially responsible business models, thereby supporting ecological balance alongside economic growth. The principles of rural policy — OECD frameworks are depicted in Figure 2.

Finally, in terms of social equity and inclusion, the DAY-NRLM — which has mobilised over 10 crore rural households into self-help groups — demonstrates the power of collective organisation in strengthening financial inclusion and entrepreneurial capacity. Access to global markets stimulates production, generates employment, increases rural incomes and reduces urban migration, while cluster-based and cooperative models ensure benefits are equitably distributed across communities (Ministry of Rural Development, 2023).

Figure 2 : Principles of Rural Policy — OECD Framework



5. Case Studies : Transformative Practice in Rural MSME Development

5.1 Pochampally Ikat Cluster, Telangana — Tradition Meets Global Markets

The Pochampally Ikat handloom cluster in Telangana represents one of India's most successful examples of rural MSME globalisation through cluster-based development.

Supported under the MSE-CDP, the cluster has received recognition including a Geographical Indication (GI) tag, which protects the authenticity of its traditional double-ikat weaving technique. The cluster exports to markets in the United States, Europe and Southeast Asia, with participating enterprises reporting significant growth in order volumes following cluster-level quality upgradation and common facility centres established under government support (Ministry of MSME, 2023). The Pochampally case demonstrates that cultural and indigenous branding, when underpinned by institutional support and quality certification, can translate traditional skills into globally competitive products.

5.2 Moradabad Brassware Cluster, Uttar Pradesh — Industrial Scale and Export Leadership

The Moradabad brassware cluster, often referred to as the "Brass City of India", has evolved from a local artisanal industry into a globally recognised export hub, commanding a significant share of handicraft exports to European and North American markets. The cluster's success is attributable to sustained investment in product design innovation, adoption of international quality standards and active participation in overseas trade fairs facilitated through the International Cooperation (IC) Scheme of the Ministry of MSME. The cluster illustrates how PPP-enabled infrastructure — common testing facilities, design centres and export facilitation cells — can enhance the global competitiveness of geographically concentrated rural industries.

5.3 Palash Scheme, Jharkhand — Women-Led Rural Entrepreneurship

The Palash scheme, launched by the Jharkhand state government in 2020, constitutes a landmark initiative in women-led rural enterprise development. By unifying products made by rural women self-help groups under a single brand identity, the scheme enhances market value, ensures quality consistency and provides producers with equitable income. The initiative has positively impacted over 3.2 million women and established more than 46 Palash Marts offering products including mustard oil, rice, honey and bamboo handicrafts. Its recognition by the Asian Development Bank Institute and inclusion as a case study in IIM Ahmedabad's curriculum affirm its replicability as a model for women-led rural enterprise development (Government of Jharkhand, 2023).

5.4 Rural Technology Business Incubator (RTBI), IIT Madras — Bridging Local Knowledge and Global Innovation

The Rural Technology Business Incubator at IIT Madras exemplifies the Triple Helix model in practice, linking rural entrepreneurs with digital and mobile technology solutions

developed through academic research. The RTBI has incubated enterprises in agri-tech, rural fintech, healthcare and renewable energy, demonstrating how university–industry collaboration can democratise access to frontier technologies for rural communities. The model provides not only technology development support but also entrepreneurial mentoring, market linkages and investor access — addressing the multi-dimensional barriers that rural innovators face (IIT Madras, 2023).

5.5 Calcutta Export Company — Digital Transformation for Global Reach

Calcutta Export Company, honoured with the Small Enterprise Gold Trophy for being the top MSME exporter in 2021–22, exemplifies how investment in digital systems — ERP platforms, international certification and digital invoicing — can enable even small enterprises to establish strong market presence in Europe and the Middle East. The company's experience underscores that digital transformation is not merely a technology upgrade but a strategic shift in how rural and small enterprises conceptualise and execute their market engagement (Ministry of MSME, 2022).

6. Challenges to Inclusive Globalization and Collaborative Innovation in Rural MSMEs

6.1 Inadequate Physical and Digital Infrastructure

Infrastructure remains the most critical bottleneck for rural MSMEs. Unreliable electricity supply, poor transportation networks and inadequate cold storage and warehousing facilities disrupt production schedules and supply chain reliability. Despite the progress of Bharat Net in extending broadband to gram panchayats, limited last-mile internet penetration continues to restrict access to e-commerce platforms, digital payment systems and virtual knowledge networks. Without consistent and affordable infrastructure, rural entrepreneurs cannot reliably engage in international trade or benefit from digital innovation platforms (SIDBI, 2025).

6.2 Limited Financial Literacy and Access to Institutional Credit

Although numerous financial schemes — MUDRA Yojana, PMEGP and CGTMSE — provide credit access and subsidy support, a significant proportion of rural entrepreneurs remain unaware of these facilities or face procedural barriers in accessing them. Low levels of financial literacy prevent entrepreneurs from preparing business plans, navigating banking processes or understanding loan repayment mechanisms. Consequently, many rural MSMEs remain dependent on informal credit sources at high interest rates, constraining both long-term sustainability and innovation

investment. The structural gap in credit access has broader implications for economic equity, leaving small businesses vulnerable to liquidity crises and unable to invest in scale or modernisation (RBI, 2023).

6.3 Skill Gaps and Low Technological Adoption

A significant proportion of rural MSME owners and workers lack the technical skills, digital literacy and innovation management capabilities required to compete in globalised markets. Training in e-commerce, export documentation, product standardisation and digital marketing remains insufficient and uneven across states. This gap results in limited technological adoption, reduced productivity and an inability to meet international quality benchmarks — thereby directly constraining global competitiveness (Subrahmanya, 2017).

6.4 Market Information Asymmetry

Rural MSMEs frequently lack access to timely and reliable information on international market trends, pricing structures and evolving consumer preferences. This asymmetry prevents entrepreneurs from tailoring products to global demand or identifying opportunities in niche markets. For example, artisans producing handicrafts may be unaware of emerging eco-design trends or sustainability certification requirements in European markets, directly limiting their export potential. Bridging this information gap requires institutional mechanisms — market intelligence services, trade facilitation cells and digital knowledge platforms — specifically calibrated for rural entrepreneurs.

6.5 Fragmentation and Informality

The rural MSME sector is characterised by high fragmentation, with the majority of enterprises operating in the informal economy without formal registration, standardised business records, or regulatory compliance. This informality creates a vicious cycle: informal enterprises cannot access institutional credit or government schemes; without such support, they lack the capacity to formalise and in the absence of formalisation, they remain invisible in policy-making and excluded from global value chain participation. Encouraging formalisation through simplified registration under the Udyam portal and targeted incentive structures is essential to breaking this cycle.

6.6 Policy Implementation Bottlenecks

While the Government of India has introduced a comprehensive architecture of policies for MSME development, significant challenges in implementation reduce their effective reach. Delays in fund disbursement, inadequate coordination between central and state agencies and complex procedural requirements discourage rural entrepreneurs from availing benefits. The absence of a streamlined grievance redressal mechanism further erodes trust in institutional support systems. These implementation gaps are compounded by insufficient monitoring and evaluation frameworks that fail

to capture cross-sectoral synergies or identify duplication of resources across schemes.

6.7 Competitive Pressures from Global Players

Globalization simultaneously creates market access opportunities and intensifies competitive pressures. Rural MSMEs face competition from multinational corporations with advanced technologies, efficient supply chains and substantial marketing capabilities. Without adequate support in product innovation, quality improvement and brand development, rural enterprises risk being marginalised in global markets. Developing sustainable competitive advantages through cultural branding, GI certification and cluster-level quality systems is essential to enable rural MSMEs to occupy defensible market positions.

7. Enabling Policy Frameworks and Government Support Mechanisms

7.1 Digital Infrastructure and Connectivity

Digital infrastructure has emerged as a cornerstone of both globalization and rural innovation. The Digital India initiative and the Bharat Net project — working to connect all 2.5 lakh gram panchayats with high-speed broadband — are foundational investments. This connectivity empowers rural MSMEs to participate in e-commerce, virtual trade fairs and global knowledge platforms. Complementing this, the proliferation of Common Service Centers (CSCs) and platforms such as UPI and ONDC (Open Network for Digital Commerce) are reshaping how rural businesses interact with markets and consumers at both national and international levels.

7.2 Financial Inclusion and Credit Access

Schemes including PMEGP — which has generated over 8 million jobs through credit-linked subsidies — the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), Stand-Up India and MUDRA Yojana have collectively strengthened entrepreneurial opportunities for marginalized groups. The success of DAY-NRLM, which has mobilised over 10 crore rural households into SHGs, demonstrates the transformative power of collective financial organisation. Expanding access to microinsurance, digital banking and financial literacy programmes remains a priority for sustaining these gains.

7.3 Capacity Building and Skills Development

The Entrepreneurship and Skill Development Programme (ESDP) and Skill India Mission provide rural entrepreneurs with digital literacy, trade competencies and innovation management capabilities. Cluster-level training centres, incubation facilities and export facilitation cells established under the MSE-CDP complement these national programmes by providing contextualised, sector-specific skill development.

Deen Dayal Upadhyaya Grameen Kaushalya Yojana has further expanded placement-linked skills training for rural youth, improving employability and entrepreneurial readiness.

7.4 Export Promotion and Market Linkages

Export Promotion Schemes for MSMEs support international marketing, quality certification and participation in overseas trade fairs. The International Cooperation (IC) Scheme provides rural MSMEs with international exposure, market linkages and credibility within global value chains. The Government e-Marketplace (GeM) and platforms like Amazon Global Selling and Etsy offer direct channels for rural producers to access international buyers, eliminating intermediary dependencies. Market Development Assistance (MDA) and Agro & Food Processing Support further reduce the cost barriers to international market entry for rural enterprises.

7.5 Innovation Ecosystems and Cluster Development

The MSE-CDP promotes the cluster approach, allowing enterprises in similar sectors and regions to share resources, benefit from common facilities and collectively improve competitiveness. Establishing innovation hubs and incubators in rural regions — modelled on the RTBI at IIT Madras — can foster collaboration between MSMEs, startups and research institutions, creating ecosystems of knowledge exchange and co-creation. Participation in Smart Village initiatives further integrates digital infrastructure, healthcare, education and technology-enabled agriculture into coherent rural development ecosystems.

8. Research and Policy Gaps and Future Outlook

8.1 Identified Research and Policy Gaps

A systematic review of the literature and policy landscape reveals several significant gaps that constrain the effectiveness of current interventions and limit the analytical understanding of rural MSME development under conditions of globalization and collaborative innovation.

First, there is a notable absence of robust measurement frameworks for assessing the synergy created between government schemes. Programmes such as Digital India, PMEGP, DAY-NRLM, MSE-CDP and Skill India operate with distinct mandates and institutional homes, yet their combined effects on rural MSME development remain largely unmeasured. The absence of an integrated monitoring and evaluation architecture prevents policymakers from identifying where cross-scheme synergies are being realised and where duplication or resource leakage occurs.

Second, inter-scheme coordination assessment is insufficient. While individual programme reviews exist, there is

limited systematic analysis of coordination mechanisms between central ministries, state agencies and district-level implementation bodies. This gap is particularly pronounced in multi-sectoral interventions that involve both the Ministry of MSME and the Ministry of Rural Development.

Third, the effectiveness of collaborative innovation outcomes is inadequately evaluated. Despite the proliferation of incubators, innovation hubs and PPP models, there is limited longitudinal evidence on the sustainability of enterprises emerging from these support systems, the quality of jobs created or the extent to which collaborative processes generate locally embedded innovation capacity as opposed to externally driven technology transfer.

Fourth, cross-sectoral integration benefits — particularly at the intersection of rural MSMEs with climate adaptation, gender equity and digital governance — receive inadequate evaluation attention. The impacts of sustainability transitions, green certification and eco-entrepreneurship on rural MSME competitiveness remain under-researched.

Fifth, the paper itself acknowledges a methodological gap: the reliance on secondary data limits the granularity of enterprise-level evidence. Primary survey-based research across diverse rural MSME clusters, disaggregated by sector, gender, region and formality status, would significantly strengthen the evidence base.

8.2 Future Outlook: Strategic Priorities

Looking ahead, the roadmap for rural MSMEs must be built on five strategic pillars.

Smart Villages and Rural Industrial Clusters. The Smart Village concept — integrating digital infrastructure, e-governance, tele-medicine, e-learning and IoT-enabled agriculture — offers a coherent framework for creating self-sustaining rural ecosystems in which MSMEs serve as both beneficiaries and drivers of innovation. Rural industrial clusters, anchored in sectoral specialisation and supported by common facility centres, logistics networks and digital platforms, represent the enterprise-level complement to village-level smart infrastructure.

Green Infrastructure and Sustainable Production. Investment in solar energy, EV charging infrastructure, water recycling systems and waste management facilities will reduce operational costs for rural MSMEs while enabling them to meet the increasingly stringent environmental standards demanded by global markets. Green certification and eco-labelling programmes can convert environmental compliance into competitive advantage, particularly in export markets.

Precision Agriculture and Agri-Tech Innovation. IoT-based irrigation systems, AI-driven crop advisory services, drone-based monitoring and blockchain-enabled traceability are transforming the economics of rural agriculture and agro-

processing. Collaborative innovation between agri-tech startups, research institutions and farmer producer organisations (FPOs) can accelerate the diffusion of these technologies into rural MSME value chains.

Women and Youth Entrepreneurship. Women and youth represent the most significant under-utilised entrepreneurial resources in rural India. NITI Aayog's policy dialogues highlight the importance of women-led enterprises in building resilient rural economies (NITI Aayog, 2024). Targeted programmes — combining digital literacy, financial access, mentorship and market linkages — are essential to converting this potential into sustained enterprise development. The Palash Scheme demonstrates the scalability of women-led rural enterprise models when backed by institutional support and branding strategies.

Global Platform Integration and Diplomatic Support. World Rural Development Day (observed on July 6, as declared by the United Nations General Assembly) provides an annual platform for amplifying the contributions of rural MSMEs and fostering international collaborations. Government programmes including ODOP (One District One Product), Digital India and Startup India are expected to evolve into integrated platforms connecting rural MSMEs with global innovation networks, funding channels and compliance frameworks. As India's rural enterprises gain international visibility, diplomatic trade support — through trade agreements, bilateral investment treaties and GI protection frameworks — will be critical in sustaining their global competitiveness.

9. Conclusion

Rural MSMEs in India occupy a foundational role in shaping the country's economic, social, and cultural trajectory. As engines of employment, income generation and community empowerment, they sustain livelihoods, safeguard indigenous knowledge and preserve traditional crafts across diverse productive sectors. The integration of digital infrastructure through Digital India, Bharat Net, CSCs, UPI and ONDC has significantly enhanced connectivity and market access, enabling rural entrepreneurs to align with global standards and compete in both national and international markets.

This paper has argued that inclusive globalization and collaborative innovation, when effectively combined and mediated by enabling policy environments and digital infrastructure, constitute a strategic framework for transforming rural MSMEs into globally competitive yet locally rooted enterprises. The evidence from case studies — Pochampally Ikat, Moradabad brassware, Palash Scheme, RTBI IIT Madras and Calcutta Export Company — demonstrates that targeted interventions combining cluster development, PPPs, cooperative models and digital platforms can produce measurable outcomes in terms of export growth,

employment generation, income enhancement and cultural preservation.

However, challenges persist. Inadequate infrastructure, limited financial literacy, skill deficits, market information asymmetry, fragmentation and policy implementation bottlenecks continue to constrain the full realisation of rural MSME potential. Addressing these barriers requires a coherent, cross-sectoral strategy that integrates resource optimisation, systematic monitoring and evidence-based policy refinement. The research gaps identified — particularly in inter-scheme coordination, collaborative innovation evaluation and cross-sectoral integration — call for sustained investment in primary research and longitudinal impact assessment.

The strategic roadmap proposed in this paper — centred on Smart Villages, green infrastructure, precision agriculture technologies and women and youth entrepreneurship — provides a directional framework aligned with Atmanirbhar Bharat, Viksit Bharat 2047 and the United Nations 2030 Sustainable Development Goals. With fewer than five years remaining to the SDG deadline, the transformative potential of rural MSMEs has never been more strategically significant. Harnessing their full potential — through innovation, collaboration and inclusive globalization — will be decisive in shaping a balanced global future that is equitable, sustainable and resilient.

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