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# **INTEGRATED FARMING SYSTEMS AND AGRO-TOURISM DEVELOPMENT IN INDIA: AN ECONOMIC ANALYSIS OF RURAL INCOME DIVERSIFICATION AND SUSTAINABLE LIVELIHOODS**

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## **ABSTRACT**

India's rural economy is undergoing a structural transition from production-centred monoculture toward diversified and multi-functional livelihood systems. In this context, the present paper examines the economic significance of Integrated Farming Systems (IFS) and agro-tourism as complementary strategies for rural income diversification and sustainable livelihood development. The study is grounded in the contemporary Indian context, where agriculture and allied activities contribute about 18% of total Gross Value Added, yet the sector still accounts for 43.0% of total employment in 2025, indicating continued dependence on a sector marked by fragmented holdings, seasonal vulnerability, and unstable income streams (Government of India, 2026a, 2026b). Simultaneously, the expansion of domestic tourism, with 2,509.13 million domestic tourist visits in 2023, has created growing scope for farm-based experiential enterprises and rural service-sector opportunities (Government of India, 2025).

The paper adopts a descriptive and analytical approach based on secondary data drawn from government reports, policy documents, and recent scholarly literature. The analysis shows that IFS strengthens livelihood sustainability through enterprise diversification, resource recycling, risk reduction, and improved labour utilization, while agro-tourism extends the farm economy into hospitality, local food systems, direct marketing, and visitor-based services. Their integration transforms the farm from a purely productive unit into a multi-functional rural enterprise system capable of generating year-round and multi-source income.

The study concludes that the IFS-agro-tourism linkage offers a viable pathway for strengthening rural resilience, women's and youth participation, local entrepreneurship, and sustainable rural development in India. However, its long-term success depends on policy convergence, institutional coordination, credit support, infrastructure improvement, and targeted skill development.

**Keywords:** Integrated Farming Systems, Agro-Tourism, Income Diversification, Sustainable Livelihoods, Rural Economy, India.

## **1. Introduction**

Indian agriculture continues to occupy a central position in the national economy, yet its developmental contradictions remain acute. The sector contributes about 18.4% of India's Gross Value Added (GVA) and supports a very large share of the workforce, even as structural vulnerabilities such as declining profitability, fragmented holdings, and climate-sensitive production intensify rural distress. Small and marginal farmers constitute nearly 86% of operational landholders, and the average operational holding is only 1.08 hectares, making conventional monoculture increasingly inadequate for sustaining rural livelihoods (Department of Agriculture & Farmers Welfare [DA&FW], 2025). Recent evidence also shows that the average monthly income of an agricultural household was ₹10,218, highlighting the limits of single-source farm earnings in meeting household needs.

In this context, Integrated Farming Systems (IFS) and agro-tourism have emerged as complementary pathways for rural diversification. IFS promotes the integration of crops, dairy, poultry, fisheries, horticulture, and composting in a circular, resource-efficient farm structure, while agro-tourism converts farm landscapes, local cuisine, and rural culture into value-generating visitor experiences. Indian examples such as Maharashtra's Agri-Tourism Policy and Gujarat's tourism-led rural enterprise approach demonstrate that diversified farming linked with tourism can create employment, direct marketing opportunities, and resilient village-based entrepreneurship.

## 2. Review of Literature

Recent literature on Integrated Farming Systems (IFS) and agro-tourism reflects a significant shift in rural development discourse from narrow productivity enhancement toward broader concerns of livelihood resilience, diversification, and sustainability. In the Indian context, this shift is especially important because rural households continue to face fragmented landholdings, ecological degradation, unstable farm income, and limited non-farm opportunities. Studies such as Kumar et al. (2025) and Thakur et al. (2025) show that IFS is increasingly understood as a diversified livelihood model that improves productivity, profitability, labour absorption, soil health, and resource-use efficiency rather than merely a technical farming practice. Similarly, Bhagat et al. (2025) and Akter et al. (2025) provide empirical evidence that integrated farming models outperform monocropping in both economic and ecological terms, while also strengthening household resilience and adaptive capacity.

Parallel scholarship on agro-tourism has emphasized its role as an instrument of rural income diversification, local entrepreneurship, and community-based development. Patterson et al. (2024) and Turtureanu et al. (2025) interpret agritourism as a sustainable rural development strategy, while Indian studies such as Lakhera et al. (2025) and Sati (2025) show that rural tourism and homestay models can enhance employment, enterprise formation, and local participation when supported by institutional mechanisms.

However, a critical research gap remains. Existing literature largely treats IFS as a production model and agro-tourism as a service model, with very limited attention to their economic interdependence. There is insufficient scholarly analysis of how diversified farm structures can enhance agro-tourism attractiveness and how tourism-based income can, in turn, strengthen farm sustainability and livelihood security. Thus, the need remains for an integrated economic framework that examines IFS and agro-tourism together as a unified pathway for sustainable rural development in India.

## 3. Research Objectives

### General Objective

To examine the role of Integrated Farming Systems and Agro-Tourism Development in India as a combined rural economic model for promoting income diversification, sustainable livelihoods, employment generation, rural entrepreneurship, and inclusive rural development.

### Specific Objectives

To study the conceptual and economic foundations of Integrated Farming Systems in the Indian rural context.

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To examine the growth, scope, and development potential of agro-tourism as a rural enterprise model in India.

To analyse the economic relationship between Integrated Farming Systems and agro-tourism in strengthening diversified rural livelihoods.

To assess the role of integrated farming and agro-tourism in rural income diversification and reduction of dependence on single-source agricultural income.

To evaluate the contribution of the integrated model to employment generation, including family labour utilization, local job creation, and reduction of seasonal underemployment in rural areas.

To examine the potential of Integrated Farming Systems linked with agro-tourism in promoting rural entrepreneurship, value addition, and local market development.

To analyse how the integration of farming and agro-tourism supports sustainable livelihood development through resource optimization, ecological balance, and resilience-building.

To identify the major challenges, constraints, and institutional barriers affecting the adoption and expansion of integrated farming-based agro-tourism in India.

To study the relevance of this integrated model in addressing current Indian rural development concerns, such as small and fragmented landholdings, unstable farm income, migration, and limited non-farm opportunities.

To suggest suitable policy measures and development strategies for strengthening Integrated Farming Systems and agro-tourism as complementary pathways of sustainable rural transformation in India.

#### **4. Research Methodology**

The study adopts a descriptive and analytical research design based entirely on secondary data to examine the economic relevance of Integrated Farming Systems (IFS) and agro-tourism in promoting rural income diversification and sustainable livelihoods in India. It is conceptual and policy-oriented in nature, interpreting existing evidence through the perspectives of agricultural economics, rural development, and livelihood sustainability. Data are collected from government reports, ministry publications, NABARD, MOSPI/NSS, PLFS, NITI Aayog, RBI, FAO, World Bank, and recent peer-reviewed studies. The methodology is suitable for structured sectorial analysis, though it is limited by dependence on published sources and lack of localized primary-level evidence.

#### **5. Conceptual Framework**

The conceptual framework of this study is based on the transformation of the Indian farm from a single-output production unit into a multi-functional rural enterprise. This transition is highly relevant in India, where agriculture contributes about 18% of Gross Value Added, yet still supports 43.0% of total employment, indicating the continued dependence of rural households on a sector marked by income instability and structural vulnerability.

In this framework, Integrated Farming Systems (IFS) function as the production-side variable. IFS combines crops, dairy, poultry, fisheries, horticulture, agro-forestry, and composting in a circular structure

where the output of one enterprise becomes the input of another. This model improves resource recycling, labour utilization, risk reduction, and year-round income generation, especially for small and marginal farmers with limited land resources .

Agro-tourism functions as the service-side variable. It transforms farm landscapes, rural culture, local cuisine, indigenous knowledge, orchards, dairying, and village experiences into marketable tourism services. In India, examples from Maharashtra's Agri-Tourism Policy and broader rural tourism policy frameworks illustrate how farms can become centres of direct marketing, hospitality, educational tourism, and village-based entrepreneurship.

The framework is theoretically supported by the Sustainable Livelihoods Approach, farm diversification theory, and agro-ecological systems thinking. These approaches explain how households strengthen natural, financial, social, and human capital by diversifying both production and services.

The central proposition is that the interaction of IFS + Agro-tourism generates five interrelated outcomes:

Income Diversification through multiple farm and tourism revenue streams

Employment Generation through year-round labour engagement

Resource Efficiency through recycling and reduced external input dependence

Livelihood Resilience through lower exposure to crop and market shocks

Sustainable Rural Development through entrepreneurship, women's participation, and youth engagement.

Thus, the framework may be expressed as:

IFS + Agro-tourism → diversified income + better labour use + direct marketing + resource efficiency → sustainable livelihoods → inclusive rural development in India

## **6. Integrated Farming Systems in India**

**Meaning and Concept:** Integrated Farming Systems (IFS) in India refer to the deliberate integration of crops, livestock, poultry, fisheries, horticulture, apiculture, agro-forestry, composting, and biogas within one farm unit so that the output or residue of one enterprise becomes the input of another. Unlike monoculture, IFS follows a circular bio-economy model that improves productivity, reduces waste, and strengthens farm sustainability .

**Indian Context and Need:** IFS has gained importance because Indian agriculture continues to support a large rural population under conditions of fragmented holdings, rising input costs, and income instability. Agriculture and allied activities remained economically significant, with sectoral GVA reaching ₹52,08,800 crore in the 2025–26 second advance estimates, showing the continuing centrality of the farm sector in India .

**Major Components and Models:** Indian IFS models vary by region. Common combinations include crop + dairy + horticulture in Maharashtra and Karnataka, rice–fish–duck systems in eastern India, and crop + poultry + beekeeping + composting for smallholders. A recent 1-hectare ICAR-IARI model includes crop production, pisciculture, duckery, poultry, apiary, agroforestry, composting, dairy, and biogas, showing that even limited land can support multiple enterprises .

**Economic Rationale:** IFS creates multiple income streams throughout the year. Dairy generates daily cash flow, horticulture provides seasonal returns, fisheries and poultry yield short-cycle income, and composting reduces expenditure on fertilizers. A comparative model cited in the text shows that monoculture generates only 120–150 man-days per year, while IFS can generate 250–320 man-days, indicating its strong employment potential .

**Resource Recycling Benefits:** The operational strength of IFS lies in recycling farm resources. In a typical 1-hectare IFS unit, about 11.47 tonnes of Farm Yard Manure and 1.81 tonnes of biogas slurry can recycle approximately 91 kg nitrogen, 42 kg phosphorus, and 75 kg potassium, saving nearly ₹12,133 annually in input costs. Soil Organic Carbon can also improve from 0.35% to 0.53% over time, strengthening long-term soil fertility .

**Risk Reduction and Significance:** IFS reduces production and market risk because income is not tied to a single crop. In the event of crop failure, livestock, poultry, or fisheries provide income support. Recent evidence cited in the text shows that integrated systems can generate 3.89 times higher system productivity than conventional systems. Therefore, IFS is highly significant in India as a model for income diversification, employment generation, ecological sustainability, and rural resilience .

## **7. Agro-Tourism Development in India**

**Concept and Meaning:** Agro-tourism in India refers to tourism activities directly linked with agricultural landscapes, farm operations, rural life, local cuisine, and village culture. It transforms the farm from a purely productive unit into a multi-functional economic space where agriculture, hospitality, recreation, and education coexist. In this sense, agro-tourism represents the practical expression of multifunctional agriculture, where the farm produces not only crops but also experiences, services, and rural value addition .

**Growth and Market Potential:** Agro-tourism has gained momentum because of the rapid growth of domestic tourism and the rising preference for experiential, sustainable, and place-based travel. The Ministry of Tourism reported 2,509.13 million domestic tourist visits in 2023, indicating a strong demand base from which agro-tourism can benefit. In addition, market estimates cited in the text show that the Indian agritourism market was valued at about USD 1.39 billion in 2025 and is projected to reach USD 5.67 billion by 2034, reflecting a 17.18% CAGR .

**Rural Enterprise Opportunities:** Agro-tourism widens the rural income base by allowing households to monetize underused farm assets such as orchards, ponds, local food, traditional homes, livestock interaction, and crop demonstrations. It creates opportunities in farmstays, direct-to-consumer sales, food services, craft marketing, educational tours, and cultural events. The text notes that direct-to-consumer retailing accounts for nearly 30% of revenue at successful agro-tourism sites, showing its importance in local enterprise formation.

**Experiential and Cultural Value:** The core product of agro-tourism is the farm-based experience. Activities such as bullock-cart rides, fruit harvesting, rural meals, organic farming participation, and village festivals create a “farm-to-fork” narrative for visitors. A strong Indian example is Maharashtra’s Agri-Tourism Policy, which formalizes experiences such as local food, seasonal farm participation, rural games, and direct sale of fresh produce. The Hurda festivals in Maharashtra further illustrate how seasonal agricultural traditions can be converted into tourism products while preserving local culture.

**Employment and Social Inclusion:** Agro-tourism creates employment for women, youth, and self-help groups in areas such as hospitality, guiding, food preparation, cultural performance, and marketing. The text also notes that government initiatives like Paryatan Mitra & Paryatan Didi and the PM-JUGA tribal homestay support for 1,000 homestays reflect the increasing policy focus on women's participation, youth entrepreneurship, and village-based livelihood generation.

**Economic Importance and Policy Relevance:** Agro-tourism is significant because it provides supplementary cash flow, reduces dependence on seasonal crop income, supports direct marketing, and generates village-level multiplier effects. States such as Maharashtra, Kerala, Karnataka, Wayanad, and Coorg are repeatedly cited as emerging or established agro-tourism landscapes. Although the sector still faces challenges related to infrastructure, discoverability, and uneven institutional support, the current policy architecture through Swadesh Darshan 2.0, the National Strategy and Roadmap for Rural Tourism, and rural homestay promotion shows that agro-tourism is increasingly recognized as a viable instrument of sustainable rural development in India.

## **8. Economic Linkages between Integrated Farming Systems and Agro-Tourism**

**Foundational Economic Nexus:** The economic linkage between Integrated Farming Systems (IFS) and agro-tourism lies in their shared ability to convert a conventional farm into a multi-functional rural enterprise. IFS diversifies biological production through crops, dairy, poultry, fisheries, horticulture, and composting, while agro-tourism monetizes this diversity through visitor experiences, hospitality, farm recreation, and direct marketing. Thus, production diversity becomes service diversity, creating a strong rural income multiplier.

**IFS as the Experiential Base of Tourism:** A monocrop farm offers limited visitor appeal, whereas an integrated farm with orchards, dairy units, fish ponds, apiaries, poultry sheds, compost pits, and seasonal crops provides a richer and year-round experience. Activities such as milking, fruit harvesting, fish feeding, compost preparation, and local food demonstrations turn farm operations into tourism products. This makes IFS the experiential supply base of agro-tourism in India.

**Value Addition and Direct Marketing:** One of the strongest linkages is the compression of the agricultural value chain. Instead of selling only raw produce through intermediaries, farms can process and sell products directly to tourists. Milk becomes dairy products, fruits become preserves, and grains or vegetables become farm-to-table meals. The text notes that value-added farm products can increase profit margins by 40% to 60% compared to wholesale sales, while “zero-mileage consumption” reduces transport and storage costs.

**Employment and Labour Utilization:** IFS already generates continuous labour demand through livestock care, irrigation, feeding, and crop management. Agro-tourism adds hospitality, cooking, cleaning, guiding, entertainment, and marketing roles. This creates a broader labour market within the same rural household and village economy. The text further notes that every rupee spent by a tourist may generate a local multiplier of about 2.5 to 3.5, benefiting transporters, artisans, folk performers, and local service providers.

**Income Diversification and Resilience:** IFS stabilizes farm income through multiple production streams, while agro-tourism adds service-based cash flow from entry fees, meals, farm stays, educational tours, and product sales. This reduces dependence on one crop cycle or one market channel. In periods of climatic shock or price decline, tourism income and livestock-based earnings can act as compensatory revenue sources, strengthening livelihood resilience.

Indian Policy and Practical Examples: Maharashtra offers the clearest Indian example, where agri-tourism policy links active agriculture with local food, rural games, direct farm sales, and seasonal participation. At the national level, policy support through Swadesh Darshan 2.0, the Digital Agriculture Mission, and rural tourism promotion provides institutional backing for integrated farm-tourism models. These examples show that the IFS–agro-tourism linkage is not only conceptually sound but also increasingly policy-relevant in India.

## **9. Role in Rural Income Diversification**

**Structural Need for Diversification:** Rural income diversification has become essential in India because agriculture still supports a large share of livelihoods, while landholdings remain small and income instability persists. The average operational holding is only 1.08 hectares, making mono-cropping increasingly risky for nearly 93 million agricultural households.

**Role of Integrated Farming Systems (IFS):** IFS diversifies income by combining crops with dairy, poultry, fisheries, horticulture, beekeeping, composting, and agro-forestry. This shifts the farm from a single seasonal income source to a multi-enterprise structure, generating cash flow at different intervals daily from dairy, short-cycle from poultry and seasonal from crops and horticulture.

**Role of Agro-Tourism:** Agro-tourism adds a service-based income layer through farm visits, local meals, educational tours, guided experiences, farm stays, and direct product sales. With 2,509.13 million domestic tourist visits in 2023, even a small share of this movement toward rural destinations can significantly supplement farm household income.

**Income Stability and Risk Reduction:** The IFS agro-tourism nexus acts as a livelihood portfolio, reducing overdependence on one crop or one market channel. The text notes that integrated models reported 25-30% higher net income stability than mono-cropping under climate-stressed conditions.

**Indian Example and Wider Effect:** Maharashtra’s agri-tourism model shows how farm produce, local food, seasonal activities, and tourism can coexist within one enterprise structure. This model strengthens household liquidity, creates local employment, and retains more value within the village economy.

## **10. Role in Sustainable Livelihood Development**

**Strengthening Livelihood Assets:** The combined model of Integrated Farming Systems (IFS) and agro-tourism contributes to sustainable livelihood development by improving the five key livelihood assets: natural, financial, physical, human, and social capital. IFS enhances soil fertility, biodiversity, nutrient recycling, and productive farm infrastructure, while agro-tourism adds income from farm visits, local food services, homestays, and cultural experiences, thereby widening the rural household’s livelihood base.

**Resilience Against Rural Vulnerability:** Rural households in India often face overlapping risks such as small landholdings, unstable farm income, climate stress, and seasonal employment. IFS reduces such vulnerability by diversifying enterprises: crops, livestock, fishery, horticulture, and composting so that failure in one component does not collapse the whole livelihood system. Agro-tourism further strengthens resilience by adding service-based cash flow that is not solely dependent on crop markets.

**Local Participation and Community Ownership:** Sustainable livelihood development is stronger when local communities actively participate in hosting, guiding, cooking, maintenance, and sale of local products.

Agro-tourism encourages village-level participation and supports community-based development. The text highlights that such participation strengthens local identity, collective organization, and place-based enterprise ecosystems in rural India.

**Environmental Sustainability:** IFS promotes ecological sustainability through residue recycling, reduced waste, nutrient cycling, and better use of biomass and organic matter. Agro-tourism reinforces this by making ecological quality itself an economic asset, since clean landscapes, biodiversity, and authentic farm practices improve visitor appeal. Thus, environmental stewardship becomes directly linked with livelihood sustainability.

**Women's Participation:** Women already play important roles in Indian agriculture, and the IFS - agro-tourism model strengthens their economic visibility. Women can engage in dairy, poultry, nursery work, food processing, local cuisine, homestay management, handicrafts, and guest interaction. The file notes that women-led homestay initiatives in states like Kerala and Maharashtra can contribute up to 40% of household income, indicating the strong livelihood significance of women's participation.

**Youth Engagement and Long-Term Well-Being:** The integrated model also helps reduce rural youth disengagement by linking agriculture with enterprise, hospitality, digital marketing, visitor coordination, and experience design. This creates more attractive and diversified livelihood roles. Overall, IFS and agro-tourism together support income stability, fuller labour use, ecological balance, and social inclusion, thereby offering a practical pathway for long-term sustainable livelihood development in rural India.

## **11. Challenges and Constraints**

**Financial Barriers:** Integrated Farming Systems (IFS) and agro-tourism require substantial initial investment in livestock units, ponds, sheds, irrigation, composting structures, sanitation, visitor facilities, and digital visibility. Although formal rural credit access reached 58.3% in late 2025, nearly 20% of rural households still depended on informal sources, indicating persistent credit asymmetry for diversified rural enterprises.

**Small Holdings and Infrastructure Gaps:** Small and marginal farmers, who constitute over 86% of landholders, face difficulties in scaling diversified enterprises on fragmented land. Infrastructure deficits poor roads, weak storage, inadequate power, lack of cold-chain facilities and limited digital connectivity further constrain both farm productivity and agro-tourism growth, especially in remote regions.

**Skill Deficits and Social Constraints:** Farmers are generally trained in production, not in hospitality, hygiene, digital marketing, or tourism management. Recent studies cited in the text show that 80% of respondents in a northeast India IFS study reported lack of technical knowledge, while resistance to change remains a major behavioural constraint. These limitations weaken the ability of rural households to convert farm diversity into viable visitor experiences.

**Marketing and Seasonal Volatility:** The file notes that 86.66% of respondents cited low remunerative prices, 86.33% price fluctuations, 80% high transportation cost, and 73.33% inadequate demand. Agro-tourism adds another seasonal layer, since tourist arrivals fluctuate by climate, holidays, and accessibility, creating uneven cash flow.

**Policy Fragmentation and Ecological Pressure:** Agriculture and tourism are still governed through separate policy channels, creating institutional gaps in credit, licensing, training, and market support. Unregulated

tourism may also strain water, waste, and landscape resources, undermining the ecological sustainability that makes agro-tourism attractive in the first place.

## 12. Policy Implications

**Integrated Policy Framework:** Integrated Farming Systems (IFS) linked with agro-tourism should be treated as a cross-sector rural development strategy, not as separate agriculture and tourism subjects. A dedicated policy window at Union and State levels is needed to combine farm diversification, homestays, local cuisine, and rural enterprise support.

**Cluster-Based Planning:** The Ministry of Tourism's rural tourism strategy supports cluster development. States should identify districts where diversified farming, culture, and tourism accessibility overlap, and develop IFS-linked agro-tourism clusters rather than isolated farm units.

**Blended Credit and Infrastructure:** Since the collateral-free agricultural loan limit has been raised from ₹1.6 lakh to ₹2 lakh, blended finance should now support both farm assets and tourism facilities such as sanitation, rooms, signage, and processing units.

**Skills, Inclusion, and Monitoring:** About 4,382 tourism service providers had been trained under Paryatan Mitra & Paryatan Didi by January 2026. Such training should be extended to IFS-based destinations, with special focus on women, youth, tribal regions, and integrated outcome monitoring.

## 13. Suggestions and Recommendations

**Phased Diversification:** Farmers should adopt Integrated Farming Systems (IFS) in a phased and location-specific manner, beginning with viable combinations such as crops with dairy, poultry, horticulture, beekeeping, composting, or fishery before expanding into agro-tourism. This is especially important for small and marginal farmers, who form the majority of India's landholders.

**Authentic Agro-Tourism Design:** Rural entrepreneurs should build agro-tourism around real farm activities orchards, livestock care, local cuisine, seasonal harvesting, and composting rather than artificial recreational add-ons. Maharashtra's agri-tourism model is a strong Indian example of farm-based authenticity linked with local food and direct sales.

**Cluster and Credit Support:** Tourism planners and agricultural departments should develop cluster-based agro-tourism circuits linking farms, homestays, crafts, and local food enterprises. NABARD, regional rural banks, and cooperative institutions should create blended credit products for farm infrastructure plus tourism facilities.

**Skill, Infrastructure, and Branding:** Krishi Vigyan Kendras, tourism departments, and Panchayats should provide enterprise-specific training, improve roads, sanitation, and digital connectivity, and promote verified farm-based branding. Women and youth should be prioritized in hospitality, digital marketing, processing, and local retail roles.

## 14. Conclusion

Integrated Farming Systems and agro-tourism together offer a viable pathway for sustainable rural transformation in India. In a context where the average operational holding is only 1.08 hectares, agriculture

remains vulnerable to climatic risk, income instability, and seasonal underemployment. The integration of crops, livestock, horticulture, fisheries, and tourism-linked services enables farms to move from mono-output production toward multi-functional rural enterprise models. Indian examples such as Maharashtra's agri-tourism model demonstrate this potential. Thus, the IFS-agro-tourism nexus strengthens income diversification, labour absorption, resilience, and long-term livelihood sustainability, provided it is supported by coordinated policy, finance, infrastructure, and training.

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