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A Brief Study of Integrated Farming in Saharsa District: Challenges and Opportunities

Mirza Zishan Beig
Department of Zoology,
Nehru Gram Bharati (Deemed to be University),
Prayagraj, Uttar Pradesh.
Corresponding author:
Dr. Kiran Gupta
kiranunizoo@gmail.com

Abstract

Integrated farming is gaining recognition as a sustainable and economically beneficial model, especially for small and marginal farmers in environmentally sensitive areas such as the Saharsa district of Bihar. This study investigates the role of integrated farming as a comprehensive strategy to enhance agricultural income, achieve food security, and support ecological balance in a region prone to frequent flooding and soil degradation. It analyzes the present implementation of integrated farming in Saharsa, outlines key obstacles including lack of awareness, inadequate infrastructure, financial limitations, and climatic challenges, and highlights the opportunities offered by natural resources, policy initiatives, and livelihood diversification. The study concludes that, with the right mix of policy intervention, farmer training, access to credit, and improved infrastructure, integrated farming has the potential to significantly improve rural livelihoods. The findings serve as a valuable resource for policymakers, development agencies, and farming communities focused on building a resilient and inclusive agricultural system.

Key words: *Integrated farming, climatic challenges, rural livelihoods*

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Introduction

Saharsa district in Bihar, situated within the Kosi river basin, is predominantly agricultural, with small and marginal farmers making up the bulk of the farming population. Although the region benefits from fertile soil and abundant water sources, its agricultural activities remain highly susceptible to flooding, climate fluctuations, and economic uncertainty. Integrated farming—an approach that blends crop production with livestock rearing, fisheries, horticulture, and agro forestry—presents a promising pathway to enhance livelihood stability and optimize resource use. This study examines both the challenges and prospects associated with implementing integrated farming practices in the Saharsa region.

Objectives of the Study

- To analyze the current status of integrated farming in Saharsa.
- To identify key challenges faced by farmers in implementing integrated systems.
- To explore potential opportunities and benefits.
- To suggest actionable recommendations for effective implementation

Literature Review

Integrated farming systems (IFS) have gained considerable attention in recent years as a sustainable alternative to conventional monoculture, especially for smallholder farmers in ecologically fragile zones. Researchers argue that integrated farming not only boosts agricultural productivity but also improves resilience to environmental and economic shocks (Behera et al., 2012). This approach, which merges various agricultural components such as crops, livestock, fisheries, and horticulture, is particularly useful in regions like Bihar, where rural livelihoods are heavily dependent on agriculture and vulnerable to frequent floods and resource degradation.

In a study conducted by Singh and Sharma (2020), it was found that integrated farming significantly enhances resource recycling and reduces input costs, thereby increasing net returns for small and marginal farmers. The authors emphasized the importance of location-specific models tailored to the ecological and socio-economic conditions of the area. They noted that when

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farmers diversify their production systems, they become less dependent on single sources of income, which helps in mitigating risk during adverse climatic events.

Bihar's potential for integrated farming is reinforced by its access to water bodies, fertile soil, and the presence of traditional mixed farming practices. Yet, the transition to fully integrated systems is not without obstacles. According to Mishra and Pandey (2018), a major limitation lies in the lack of awareness, technical know-how, and inadequate support infrastructure. They also highlighted that most rural farmers are unfamiliar with the scientific management of multiple enterprises, which hampers the effective implementation of IFS models.

In the specific context of Saharsa, no large-scale academic study has been undertaken to assess integrated farming; however, regional data and case studies suggest both challenges and opportunities. The district's vulnerability to annual flooding necessitates farming models that are resilient and adaptive. As per Kumar et al. (2021), integrated farming in flood-prone areas can create natural buffers and allow for rapid recovery post-disaster if supported by suitable training and institutional frameworks.

The fishing communities in India, particularly in underdeveloped and rural areas like Bihar, have attracted scholarly attention due to their socio-economic disadvantages and marginalization. In districts such as Saharsa, these communities are predominantly from scheduled castes and other marginalized groups, often facing restricted access to basic services like education, healthcare, and reliable income sources (Jha & Mishra, 2020).

Fishing, mainly practiced in rivers, serves as the main occupation for these groups. However, it is largely seasonal and vulnerable to environmental disruptions such as flooding and pollution (Singh & Kumari, 2018). Saharsa, located along the Kosi river, is prone to frequent floods that severely affect the livelihood and well-being of local fishermen. Although the region has abundant water resources, challenges such as poor infrastructure, ineffective cooperative systems, and inadequate institutional support hinder economic development (Sharma et al., 2019).

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Challenges of Integrated Farming in Saharsa

a. Natural and Environmental Challenges

1. Frequent Flooding and Water logging

Saharsa lies in the Kosi river basin, often referred to as the "Sorrow of Bihar" due to its unpredictable flooding. The annual monsoon floods frequently submerge farmlands, destroying standing crops and fish ponds. For example, during the 2020 floods, thousands of hectares of paddy fields and small-scale fishery units in villages like **Simri Bakhtiyarpur** and **Banma Itahri** were completely washed away. This not only caused crop failure but also wiped out fish stocks, leading to significant financial losses for integrated farmers relying on both activities.

2. Soil Erosion and Siltation

Heavy rainfall and the flow of silt-laden water from the Kosi River result in the erosion of fertile topsoil and the deposition of sand on cultivable land. This degrades the soil quality, reduces productivity, and affects the viability of horticulture and other integrated components. After the 2008 Kosi breach, large tracts of land in Saharsa became unfit for farming due to siltation (Jha et al., 2010)

b. Socio-Economic Constraints

1. Small and Fragmented Landholdings

Most farmers in Saharsa own less than one hectare of land, often split across multiple plots. This fragmentation makes it difficult to establish an integrated farming system that combines livestock sheds, fish ponds, and crop fields within one location. As a result, optimal resource utilization becomes challenging, and many farmers are forced to adopt only partial integration.

2. Low Literacy and Awareness

Low literacy rates, especially among older and female farmers, limit the understanding of scientific farming practices. This leads to the continuation of traditional monoculture systems rather than integrated farming. According to the **Bihar Economic Survey 2022**, over 35% of Saharsa's rural

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population has never attended school, creating barriers to the adoption of modern techniques like composting, crop rotation, or polyculture fish farming.

c. Financial and Institutional Barriers

1. Limited Access to Credit and Subsidies

Despite government schemes such as the Reservoir Fisheries Development Scheme and the National Mission on Sustainable Agriculture, many eligible farmers are unable to access institutional credit due to lack of collateral, documentation, or awareness. A field study by **ICAR-RCER (2021)** found that only 28% of farmers in Saharsa who applied for subsidies or loans under integrated farming received approval, citing bureaucratic hurdles and lack of follow-up.

2. Weak Extension Services

Agricultural extension services that provide technical training and field support are either underfunded or poorly staffed. This leaves farmers without the necessary guidance to manage diverse farm components. For instance, many farmers attempting vermicomposting or fish-livestock integration abandon the effort midway due to improper maintenance, largely because they lacked training or follow-up support from agriculture officers.

d. Market-Related Issues

1. Poor Market Linkages and Price Fluctuations

Farmers in Saharsa often depend on local middlemen who exploit the absence of organized markets. Perishable goods like vegetables, milk, and fish from integrated farms are sold at lower prices due to poor negotiation power and lack of cooperatives. During the COVID-19 lockdown, integrated farmers producing perishable goods in **Saur Bazar Block** reported losses of up to 50% due to transport shutdowns and market closures (Pandey & Kumar, 2021).

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2. Lack of Storage and Transport Infrastructure

Cold storage and refrigerated transport are nearly nonexistent in rural Saharsa. As a result, produce like milk, fish, and green vegetables must be sold immediately after harvest, often at throwaway prices. The absence of local processing or storage units further prevents value addition, reducing profit margins for integrated farmers.

Opportunities for Integrated Farming in Saharsa

a. High Resource Potential

1. Abundant Groundwater and River Systems

Saharsa, situated in the Kosi basin, benefits from an extensive water network, including rivers, ponds, and groundwater reserves. These resources offer great potential for **fish farming** and **irrigated agriculture**. In the village of **Mahishi**, several smallholder farmers have successfully adopted **integrated rice-fish farming**, using seasonal floodwater to rear fish in paddy fields. This method boosts both crop yield and fish production, making efficient use of available water.

2. Availability of Organic Materials

Due to the region's heavy reliance on livestock, there's a continuous supply of **farmyard manure, crop residues, and cow dung**, which can be used in **Vermiculture and organic composting**. A farmer group in **Saur Bazaar Block** produces Vermicompost from cow dung and crop waste and uses it in vegetable cultivation, reducing their reliance on chemical fertilizers and enhancing soil health (Kumar et al., 2022).

b. Government and NGO Support

1. Supportive Policies and Schemes

Various schemes like **Paramparagat Krishi Vikas Yojana (PKVY)**, **Rashtriya Krishi Vikas Yojana (RKVY)**, and **NABARD-backed initiatives** are promoting organic and sustainable

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farming practices in Bihar. Under PKVY, farmers in Saharsa have formed **organic farming clusters**, combining crop production with dairy and composting, which helps them qualify for input subsidies and market support.

2. Role of NGOs and Partnerships

Several NGOs and self-help groups (SHGs) in Saharsa are involved in promoting **public-private partnerships** for better farm extension and training. Organizations like **PRADAN** and **JEEViKA** are working with local farmers to integrate **poultry and horticulture units** with traditional farming, helping them access markets and improve productivity (Bihar Rural Livelihoods Promotion Society, 2021).

c. Diversified Income Streams

1. Year-Round Income Opportunities

Integrated farming allows farmers to earn from multiple sources—such as crops, dairy, fish, and vegetables—throughout the year. In **Nauhatta block**, a farmer named Rajeev Thakur has combined vegetable farming with a small dairy and fish pond. His monthly income has increased by over 50%, helping him recover from flood losses and avoid dependence on seasonal crops.

2. Reduction in Migration

The availability of **continuous, local employment** through integrated farming helps reduce migration to urban areas. During the COVID-19 pandemic, reverse-migrant youth in Saharsa were trained by local KVKs (Krishi Vigyan Kendras) in mushroom cultivation and backyard poultry, allowing them to earn livelihoods locally (ICAR-KVK Saharsa, 2021).

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d. Scope for Skill Development and Youth Engagement

1. Training in Agri-Entrepreneurship

There is significant scope to engage rural youth in **agribusiness and skill-based farming activities**. Institutions like **Bihar Agriculture University** and local KVKs have launched training programs on **organic farming, food processing, and fish breeding**. Youths trained in these skills can start small ventures like Vermicompost units, poultry farms, or dairy processing centers.

2. Encouraging Innovation

Programs supported by **NABARD** and the **Startup Bihar initiative** are encouraging young farmers to explore **low-cost innovations** in integrated farming, such as using mobile apps for irrigation schedules or organic pest control. In one case, a group of agri-graduates from Saharsa developed a low-cost **aquaponics system** that combines fish farming with vegetable production, using recycled water efficiently.

Government initiatives

The Bihar government is offering a significant subsidy under the **Reservoir Fisheries Development Scheme** to promote fish farming. Through the Department of Animal Resources and Fisheries, beneficiaries from all social categories are eligible to receive a **70% subsidy** on the total unit cost. The remaining 30% must be covered by the beneficiary either through a **bank loan or personal investment**. As per government guidelines, the cost structure has been set at **₹60,000 per hectare for fry harvesting units**, **₹3 lakh per cage**, and **₹10.50 lakh per cage in reservoir-based systems**. The 70% subsidy applies to each of these expenses. Common fish species cultivated in Bihar include **Rohu, Catla, Mrigal, Silver Carp, Grass Carp, Magur (catfish), and Pangasius**.

Government initiatives such as the Paramparagat Krishi Vikas Yojana (PKVY), Rashtriya Krishi Vikas Yojana (RKVY), and support from NABARD have played a role in encouraging farmers to adopt diversified farming practices. However, scholars such as Tripathi (2019) argue that without

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proper market access, storage facilities, and financial support, integrated farming will remain limited in scope and scale.

Data Collection and analysis

This study was conducted across ten blocks of Saharsa district—Mahishi, Nauhatta, Sonbarsa, Banma Itahari, Simri Bakhtiyarpur, Bangaon, Patarghat, Salkhua, and Kahra—where two active fishermen were selected from each block, making a total of 20 informants. The main objective was to understand their adoption of integrated farming practices. While all informants were primarily engaged in fish farming, many had diversified into related activities like foxnut cultivation, poultry (hens), or duck rearing, depending on available resources.

Data collection was carried out over 12 days through on-site visits and semi-structured interviews. Field observations, photographs, and land-type assessments were used to validate responses and understand local constraints. The sample was deliberately selected to capture variation in farming models, land access, and block-level characteristics. During analysis, the data were grouped based on types of integration—fish only, fish + foxnut, fish + hen, and fish + duck—and then compared for profitability, risk management, and year-round income generation. Results showed that 65% of the fishermen had adopted some form of integrated farming. The most common model was fish + foxnut in blocks with seasonal wetlands and marshes, such as Mahishi, Simri Bakhtiyarpur, and Salkhua. Fish + hen models were successful in blocks with better household infrastructure and shed availability. Fish + duck farming showed promise in flood-prone areas, as ducks could forage naturally and required minimal feed inputs. Fish-only farmers faced higher risks from seasonal water fluctuations and lower income stability. Integrated farmers, on the other hand, benefited from diversified income, better resilience to environmental shocks, and more efficient use of land and water. However, challenges remained—many lacked technical training, access to veterinary services, and market linkages.

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Suggestions and Recommendations

Integrated farming holds significant promise for enhancing agricultural sustainability and rural livelihoods in Saharsa district, where frequent floods and limited infrastructure pose persistent challenges. To harness its full potential, it is crucial to promote model integrated farms at the village or block level, serving as demonstration units that can guide and motivate local farmers. Strengthening training and capacity building through Krishi Vigyan Kendras (KVKs) can equip farmers with the necessary knowledge and skills to adopt diversified farming practices effectively. Additionally, improving credit access through cooperative banks and self-help groups (SHGs) can empower smallholders to invest in farm inputs, livestock, and equipment. Given the region's vulnerability to flooding, developing flood-resilient farming models is essential to minimize crop loss and maintain productivity. Furthermore, building cold storage and processing units for value addition will not only reduce post-harvest losses but also open up new market opportunities. Collectively, these measures can address the challenges faced in Saharsa and unlock the opportunities integrated farming offers for sustainable rural development

Conclusion

Integrated farming offers a sustainable solution to the agricultural challenges in Saharsa, especially for small and marginal farmers. Despite issues like poor infrastructure, low awareness, and climate risks, the region has strong potential due to its natural resources and supportive policies. With focused efforts on training, credit access, and infrastructure development, integrated farming can improve income, ensure food security, and promote ecological balance. This approach can play a key role in building a resilient and inclusive farming system in the district.

References

1. Behera, U. K., Jha, K. P., & Mahapatra, I. C. (2012). *Income and employment generation for small and marginal farmers through integrated farming systems*. Indian Journal of Agronomy, 57(4), 309–312.

ISSN: 2320-3714
Volume: 3 Issue: 1
July 2025
Impact Factor: 10.2
Subject: Zoology

2. Singh, R. K., & Sharma, P. (2020). *Integrated farming systems: A pathway to sustainability and rural prosperity*. Journal of Rural Development Studies, 8(2), 45–52.
3. Mishra, A., & Pandey, D. (2018). *Constraints and prospects of integrated farming in Eastern India*. Agricultural Economics Review, 30(1), 15–22.
4. Kumar, S., Verma, A., & Raj, N. (2021). *Flood-resilient agricultural practices in Bihar: Role of integrated farming*. Journal of Agroecology and Sustainable Development, 9(1), 20–28.
5. Tripathi, M. (2019). *Market barriers in the adoption of integrated farming systems in rural Bihar*. Indian Journal of Agricultural Economics, 74(3), 332–340.
6. Jha, R., & Mishra, S. (2020). *Marginalized communities and livelihood challenges in rural Bihar: A study of fishing castes*. Indian Journal of Rural Development, 39(2), 123–135.
7. Sharma, M., Verma, D., & Ali, F. (2019). *Climate vulnerability and fishing communities in the Kosi river belt*. Environmental Studies Review, 11(4), 203–217.
8. Singh, V., & Kumari, R. (2018). *Livelihood patterns among inland fishers in flood-prone regions of Bihar*. Indian Journal of Economics and Development, 14(1), 78–84.
9. Jha, A. K., Sinha, A. K., & Tiwari, P. C. (2010). *Impact of the Kosi flood on agriculture in north Bihar*. Indian Journal of Agricultural Economics, 65(3), 412–420.
10. Government of Bihar. (2022). *Bihar Economic Survey 2021–22*. Finance Department, Patna.
https://state.bihar.gov.in
11. ICAR-RCER. (2021). *Field Report on Adoption of Integrated Farming Systems in North Bihar*. Indian Council of Agricultural Research – Research Complex for Eastern Region, Patna.
12. Pandey, R., & Kumar, N. (2021). *Effect of COVID-19 on the agricultural economy in flood-prone regions: A case study of Saharsa*. Journal of Rural Livelihoods and Development, 9(2), 55–61.
13. Kumar, R., Singh, A., & Jha, S. (2022). *Adoption of Integrated Farming in Flood-Prone Areas: A Study from Bihar*. Journal of Rural Innovation, 7(2), 42–49.

ISSN: 2320-3714
Volume: 3 Issue: 1
July 2025
Impact Factor: 10.2
Subject: Zoology

14. Bihar Rural Livelihoods Promotion Society (JEEViKA). (2021). *Annual Report: Promoting Sustainable Livelihoods*. Retrieved from https://brlp.in
15. ICAR-KVK Saharsa. (2021). *Capacity Building of Youth through Integrated Farming Approaches*. Field Report.
16. Government of India. (2020). *Guidelines for Paramparagat Krishi Vikas Yojana (PKVY)*. Ministry of Agriculture & Farmers Welfare.
17. NABARD Bihar Regional Office. (2021). *Support for Integrated Farming Systems in Eastern India*. Internal Publication.

Airo International Journal
Peer-Reviewed
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