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Bridging the Knowledge–Adoption Gap in Integrated Farming Systems: The Missing Link in Livelihood Improvement

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Indian agriculture has witnessed a steady flow of improved technologies, diversified farming models, and extension interventions over the last few decades. Among these, the Integrated Farming System (IFS) has been widely promoted as a sustainable solution for improving farm income, employment, and livelihood security. Yet, field-level experience repeatedly shows that availability of knowledge does not always translate into adoption of practices. This mismatch—commonly referred to as the knowledge–adoption gap—remains one of the most critical challenges in realizing the full potential of IFS.

IFS Knowledge Is Growing, Adoption Is Lagging

Over the years, awareness about Integrated Farming Systems has increased substantially due to extension programmes, trainings, demonstrations, and farmer-to-farmer learning. Surveys conducted in IFS-promoted villages indicate that a majority of farmers possess moderate to high knowledge regarding basic IFS components such as crop–livestock integration, use of farmyard manure, fodder management, and diversification of enterprises. However, when actual field adoption is examined, a different picture emerges. Practice-wise analysis shows that while knowledge levels often range between 65 and 80 per cent, adoption levels frequently remain confined to 45–60 per cent. This gap suggests that knowledge alone is not sufficient to bring about behavioral change at the farm level.

Understanding the Knowledge–Adoption Gap

The knowledge–adoption gap refers to the difference between what farmers know and what they actually practice. In the context of IFS, this gap is observed across several components—scientific feeding practices in livestock, improved housing, balanced enterprise combinations, composting techniques, and value addition. Data from extension-based studies reveal that the gap is relatively low for traditional or low-cost practices, such as use of crop residues as fodder, but significantly higher for practices requiring initial investment, technical precision, or risk-bearing capacity. This indicates that adoption is influenced not only by awareness but also by economic, social, and psychological factors.

Practice-Wise Evidence from the Field

When IFS practices are analyzed individually, distinct patterns emerge. Knowledge about crop diversification and livestock integration is generally high, often exceeding 70 per cent, because these practices are familiar to farmers. In contrast, adoption of improved livestock health management, scientific feeding, and composting methods remains below 50 per cent in many cases. Similarly, while farmers may be well aware of the benefits of integrating vegetables, poultry, or fisheries into their farming system, only one-third to half of the farmers actually adopt these enterprises. This selective adoption reflects farmers' cautious approach toward practices perceived as risky or resource-intensive.

Beneficiaries versus Non-Beneficiaries

A comparative assessment between IFS beneficiaries and non-beneficiaries clearly highlights the role of institutional support in narrowing the knowledge–adoption gap. Beneficiary farmers—those exposed to regular training, demonstrations, and follow-up—consistently show lower gaps compared to non-beneficiaries. In beneficiary groups, adoption levels are often 10–20 percentage points higher than non-beneficiary farmers for the same level of knowledge. This difference underscores the importance of continuous extension engagement rather than one-time information dissemination.

Role of the Farmer FIRST Programme

Extension initiatives such as the Farmer FIRST Programme (FFP) have demonstrated that participatory and farmer-centric approaches can significantly reduce the knowledge–adoption gap. Under this programme, farmers are not just recipients of information but active partners in technology testing and refinement. Impact assessments of FFP interventions indicate that farmers exposed to on-farm trials and regular advisory support exhibit higher adoption consistency. The gap between knowledge and adoption for key IFS practices is noticeably narrower among FFP beneficiaries, particularly in livestock and allied enterprises.

Extension Contact and Information Flow

Extension contact plays a decisive role in converting knowledge into action. Farmers with high extension contact scores—frequent interaction with extension personnel, scientists, and progressive farmers—tend to show higher adoption levels. Survey data suggest that more than two-thirds of high adopters maintain regular extension contact, whereas farmers with limited contact are more likely to remain partial adopters. Information source utilization also matters. Farmers who rely on multiple sources—formal extension, fellow farmers, mass media, and mobile advisories—are better positioned to clarify doubts and gain confidence, thereby reducing the adoption gap.

Behavioral and Psychological Dimensions

Beyond economic constraints, behavioral factors strongly influence adoption decisions. Farmers with higher scientific orientation tend to evaluate technologies rationally and are more willing to adopt improved IFS practices. Similarly, farmers with moderate risk orientation are more inclined to experiment with diversified enterprises. Empirical findings show a negative and significant relationship between scientific orientation and knowledge–adoption gap, indicating that as scientific outlook increases, the gap narrows. This highlights the importance of addressing behavioral aspects through experiential learning rather than purely theoretical training.

Constraints Contributing to the Gap

Several constraints explain why farmers hesitate to adopt what they know. Commonly reported barriers include lack of initial capital, fear of loss, labour shortage, inadequate follow-up support, and limited access to inputs or services. In livestock-based IFS, irregular veterinary services and input availability further discourage adoption. Social factors also play a role. Farmers often wait to see successful adoption by peers before taking risks themselves. This “wait-and-watch” approach, though rational, delays widespread adoption.

Implications for Livelihood Security

The persistence of the knowledge–adoption gap has direct implications for livelihood security. Partial adoption of IFS practices results in sub-optimal income, lower employment generation, and limited food security gains. Studies show that farmers with higher adoption levels enjoy significantly better livelihood outcomes than those with similar knowledge but lower adoption. Thus, closing the knowledge–adoption gap is not merely a technical issue—it is central to improving the overall effectiveness of IFS as a livelihood strategy.

Strategies to Bridge the Gap

Evidence suggests that hands-on training, repeated demonstrations, and continuous advisory support are more effective than classroom-based extension alone. Farmer field schools, exposure visits, and success-story sharing help farmers visualize benefits and reduce perceived risks. Customized extension approaches—based on farm size, resource availability, and farmer motivation—are essential. Supporting farmers during the initial adoption phase through credit linkage, input facilitation, and risk mitigation can significantly accelerate adoption.

Way Forward

For Integrated Farming Systems to deliver their promised benefits, extension systems must shift focus from knowledge dissemination to adoption facilitation. Monitoring adoption behavior, identifying practice-specific gaps, and designing targeted interventions can make extension efforts more impactful. Strengthening farmer–extension linkages, promoting peer learning, and integrating behavioral insights into extension planning will be crucial in narrowing the knowledge–adoption gap.

Conclusion

The success of Integrated Farming Systems depends not on what farmers know, but on what they practice. The knowledge–adoption gap remains a critical bottleneck in achieving sustainable livelihood security. By addressing economic, behavioral, and institutional barriers through data-driven and farmer-centric extension strategies, this gap can be effectively bridged—unlocking the true potential of Integrated Farming Systems for rural prosperity.