planet

food future foundation

Integrated Farming Systems

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Actionable Area

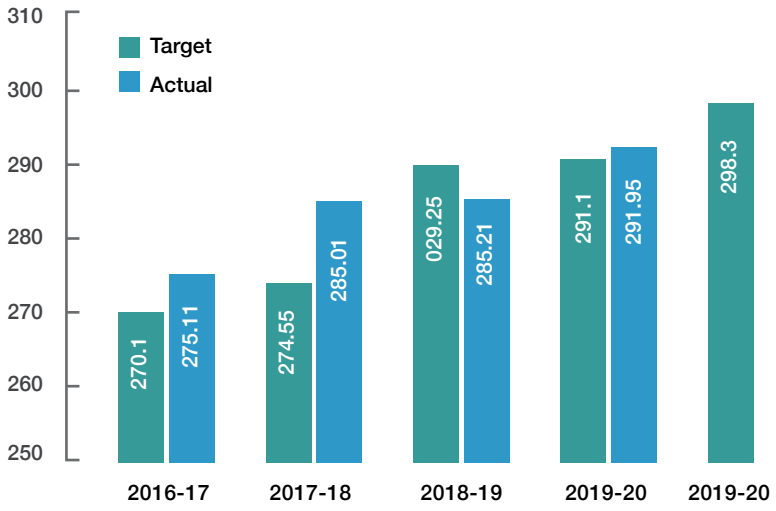
Shifting farmers' focus from individual components of household's basic needs for food (cereal, pulses, oilseeds, milk, fruit, honey, meat, etc.), feed, fodder, fibre, etc., to Integrated Farming System (IFS) approach.

Issues

- The majority of the farmers have been farming for a long time, but their focus has been on individual components and not in an integrated manner. At the Indian council of agriculture research ICAR and State Agricultural Universities level, a lot of efforts have been made aiming at increasing the productivity of different individual components of the farming system such as crop, dairy, livestock, poultry, piggery, goat keeping, duckery, apiculture, sericulture, horticulture, mushroom cultivation, etc. but lacking in their integration by following an integrated farming system approach. The integration is made so that the product of one component becomes the input for other enterprises with a high degree of complementary effects on each other. Preliminary research investigations advocated the benefits of productivity improvement by 30-50% depending upon the number and kind of enterprises and their management.

- The growth rate of agriculture in the recent past has been very slow despite rapid economic growth in India. According to the Economic Survey of India, 2008, the growth rate of food grain production decelerated to 1.2% during 1990-2007, lower than the population growth of 1.9%. In the subsequent years, the growth rate of food production has significantly fluctuated while always growing at a lesser

Food grains output
(million tonne)



Source: Second advance estimate, GOI

or an equal rate than the population growth rate. It is projected that India's population will touch 1.37 billion by 2030 and 1.6 billion by 2050. To meet the growing population of the country, India must produce 289 and 349 MT of food grains during the respective periods. The current scenario in the country indicates that the area under cultivation may further dwindle, and more than 20% of the current cultivable area will be converted for non-agricultural purposes by 2030.

- The operational farm holding in India is declining, and over 85 million out of 105 million holdings are below the size of 1 ha. Due to the ever-increasing population and decline in per capita availability of land in the country, practically, there is no scope for horizontal expansion of land for agriculture. Only vertical expansion is possible by integrating farming components requiring lesser space and time and ensuring reasonable returns to farm families. Therefore, the Integrated Farming Systems (IFS) assumes greater importance for sound management of farm resources to enhance farm productivity and reduce environmental degradation, improve the quality of life of the poor farmers, and maintain sustainability.

- The four primary goals of IFS are:

  a. Maximisation of the yield of all component enterprises to provide steady and stable income.

  b. Rejuvenation/ amelioration of system's productivity and achieving agro-ecological equilibrium.

  c. Avoid the build-up of insect-pests, diseases, and weed population through natural cropping system management and keep them at a low level of intensity.

  d. Reducing the use of chemicals (fertilisers and pesticides) to provide chemical-free healthy produce and environment to the society.

- Important elements like (i) Watershed, (ii) Farm ponds, (iii) Bio-pesticides, (iv) Bio-fertilisers, (v) Plant products as pesticides, (vi) Biogas, (vii) Solar energy, (viii) Compost making (Vermi, improved, etc.), (ix) Green manuring, and (x) Rainwater harvesting, may be included in IFS demonstrations depending upon the individual farmer's resources, interest, and opportunities.

Status

Government Initiatives

- To strengthen all aspects of cropping systems research, the 'Project Directorate for Cropping Systems Research (PDCSR)' was established at Modipuram (Meerut) in March 1989, with 'AICRP on Cropping Systems' as one of the constituent schemes of the Directorate. The earlier two components, namely 'On–Station Research' and 'On-Farm Research', remained intact.

- To promote IFS, in the year 2009-10, the government renamed PDCSR to Project Directorate for Farming Systems Research (PDFSR)'. It was further renamed as ICAR-Indian Institute of Farming Systems Research (IIFSR) in November 2014, and the mandate was redefined further as:

  a. Research in integrated farming systems on production technologies for improving productivity and resource use efficiencies.

  b. Developing efficient, economically viable, and environmentally sustainable integrated farming system models for different farming situations.

  c. On-farm testing, verification, and refinement of system-based farm production technologies.

  d. Coordinating and monitoring integrated farming systems research in the country.

Vision 2030

An inclusive and integrated farming system contributes to a food system and ensures nutritional security for communities and consumers for better human and environmental health.

India's achievement under the Rainfed Area Development website of the NMSA in 2019-20 were 52,079 hectares under various IFS activities.

These include horticulture-based farming, livestock-based farming, agroforestry-based farming systems, water-harvesting and management, and green manuring.

Pathways

POLICY

Prepare a policy draft for the consideration of planners to promote IFS models at a large scale with nominal financial assistance either through short, medium, or long-term loans or other promotional advantages.

Initiate a policy dialogue at the national and state level balancing food and nutrition security, self-sufficiency, and sustainability to influence the policy around IFS.

Establish a single-window service provision for farmers at the Panchayat/ Block level to avail the schemes related to IFS. Currently, one has to move within the departments for financing the different components of IFS as the governmental system is not yet synced with the IFS approach.

Explore the option of integrating different components of IFS with the Kisan Credit Card (KCC) and accordingly set the credit limits, as availability and convenience of services are a major concern.

Promote incentives for Gram Panchayat in IFS at a landscape level, on lines of Maharashtra government's statewide 'Swachata Mission' competitions and integrate IFS plans in the Gram Panchayat development plan(GPDP) to implement measures at a grass-root level and create evidence for further policy directions.

Explore the convergence of IFS with MGNREGA at the Gram Panchayat level since it would be instrumental in wider adoption. Use part of the fund spent on subsidising the cost of fertilisers etc., to financially support farmers for agroecological/ IFS practices.

Bring policymakers together by highlighting associated risks and benefits.

Pathways

IMPLEMENTATION

Assess and refine technologies developed at the research station to make these more participatory and feedback-centric for greater adoption in the cultivators' field.

Improve the planning capacity of the farmer by understanding what resources are available, their needs, and challenges and accordingly design and implement the IFS component and approaches.

Creating remunerative markets or strengthening existing ones as markets for commodities coming from the sustainable cropping systems is a major concern.

Back the certification of sustainable and environmentally friendly systems in order to create a market booster.

Mandate the government’s agricultural extension systems to promote IFS and create IFS missions at the state and national level to ensure its design and implementation. Further, collaborating with civil society organisations (CSOs) and community-based organizations (CBOs) to scale integrated farming.

Prepare contingent planning to counteract the weather vagaries and climate threats under different farming situations.

Promote agroforestry models which combine different types of trees, meeting the varying requirements for food, fodder, fuel, control soil erosion, etc., to ensure year-round income with reduced risk from one system. Such models diversify both farmers’ income and risk during a time of crop failures or extreme climatic events.

Place climate-resilient indigenous varieties carefully in the overall IFS approach and ensure the availability of seeds at the village or cluster level for farmers through seed production and establishing seed banks. Similarly, intercropping and food crop diversification is key to effectively addressing weather vagaries and increasing dietary diversity.

Include local agro-advisory services in the local language, including the weather forecast, in the planning process.

Pathways

KNOWLEDGE AND RESEARCH

Implementation (Contd)

Introduce a monitoring & evaluation system for assessing adoption and taking corrective measures.

Look at IFS as an approach for a better and optimised utilisation of resources at the landscape level for different IFS enterprises. IFS at the landscape level may be much more suitable than at the household/individual (farm) level – carefully tread it forward. Further, demonstrate the feasibility of economics notwithstanding ecological security to pave the path for consolidation and further expansion.

Look at the overall IFS from three lenses viz. Social (addressing vulnerabilities in terms of capacity, risk mitigation, health, and nutritional security), Environmental (climate change risks recorded in food systems document), and Institutional (national missions and flagship programs).

Create a comprehensive 'database on farming system' concerning the type of farming system, infrastructure, economics, sustainability, etc., under different farming situations.

Record traditional IFS models and challenges/opportunities across agro-ecological zones and determine a separate set of indicators to measure the productivity of the agro-ecological approach.

Look at the success matrix of IFS to transform the food systems from a systems point of view and concerning the benefits accrued from it.

Digitise farms to understand the demographic and cropping profile of the farmers and accordingly devise the mechanism for extension and other services.

Build traceability systems to measure the success of various interventions at the farm for transparency and trustworthiness.

Pathways

Knowledge and Research (Contd)

Enhance peer leanings by developing best practices at farm levels and promoting them among other farmers (Positive evidence).

Create global research partnerships to develop evidence and solutions around IFS and agro-ecology-based farming and encourage global and regional exchanges.

Develop research modules of farming systems under different holding sizes with varying economically viable and socially acceptable systems; state agriculture universities (SAUs) may develop the education modules around IFS.

Move from a prescriptive model in farming to a systems-based approach wherein collaboration and co-creation are focused and exercised. Further, list out farmers as resource persons and trainers in the form of a digital map to acknowledge that knowledge exists beyond universities.

Develop master trainers to ensure the last mile reach of extension services and develop integrated modules which build the capacity of various kinds of community resource persons (CRPs) around IFS (NRLM is an example). Revise or re-design the training modules based on the principles of IFS or agroecology.

Develop a course curriculum in University Grant Commission (UGC) and other academics around agroecological-based farming systems to further the research agenda.

Since behaviour change is key to changing practices, introduce social behavior change-based approaches, e.g., experiential learning, participatory learning, action, etc.

Explore social media to promote knowledge. For example, create a YouTube Channel to promote IFS topics. Also, where possible, have success stories promoted by role model farmers.

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