

Bio-diverse integrated farms

Means for reducing rural poverty

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Farmers of fragile agro-ecosystems have developed some unique integrated farming systems, to make their farms more resilient to factors like changing climatic conditions, declining soil fertility levels and decreasing farm income. While many NGOs have promoted such improved systems, it is time to reckon these systems as units of planning for large scale adoption.

In developing countries, ensuring food, nutrition and livelihood security through agriculture without causing negative externalities on social, economic and environmental sustainability is a challenge. This assumes greater proportions in the context of ever-increasing pressure on land and other natural resources, globalization and urbanization. In West Bengal, the picture is even bleaker where 85% farmers are small and marginal in nature. The situation becomes harsh in marginal and less integrated environments like the rainfed and the coastal-saline production systems, where most of the poor people live. In such a situation, small holder agriculture assumes great significance.

Future of agriculture and rural poverty alleviation depends on how we ensure food, nutrition and livelihood security through sustainable and integrated family farming, which is resilient to uncertainties of climate and markets. Promotion of sustainable farming systems as a poverty alleviation strategy seems to be an appropriate solution. Though simple, it is still a challenging proposition.

The Integrated Bio-diverse Family Farm

Agriculture in South Paraganas, a coastal district in West Bengal, is characterized by mono-cropping systems. Soil salinity particularly in dry months is a major problem. Farmers migrate to nearby towns and cities in lean agricultural months. Agricultural productivity is low and there is a cyclic productivity-led poverty trap affecting the farmers. Small holdings limit the expansion of conventional farming and the youth are reluctant to pursue farming as an occupation.



Photo: Author

Bio-diverse farming in a 700 sq.m plot



Photo: Author

Poultry is integrated with fishery to reap more benefits

To overcome the constraints, several hundreds of farmers in coastal saline area in West Bengal have established Integrated Bio-diverse Family Farms (IBFF) with the support from Development Research Communication and Service Centre (DRCSC), a Kolkata-based NGO. There are also thousands of similar IBFF that have been

developed by the farmers themselves to sustain livelihoods from their small holdings. One could also find IFS in smaller holdings of less than 30 decimal.

Ramakrishna Mission Vivekananda University (RKMVU) aimed at establishing a model village on Integrated Rural Development, conducted an intensive study on IBFF to understand IFS models. The study was made as a part of the academic research programme.

We selected an IFS farm of 1 acre (60 katha) size from Patharpratima Block of South 24 Parganas district for our study. The one acre land was utilized as follows: 30-40 katha (50-66%) for raising crops, 10-12 katha for home and homestead (16-20%), 8-10 katha for water body (13-16%) and 4-6 katha for livestock raising (6-10%). Substantial space was created by raising and broadening the bunds. For every 0.27 ha crop field, around 0.02-0.03 ha of cultivable land was created on the bunds, on which vegetables were grown all through the year. The ponds and trenches around the crop fields were interconnected to facilitate water flow in which fishes were reared. Apart from this, some space was created by using aerial cultivation on bamboo and rope made scaffolds. Since the farm was small in size, intensifications were enhanced by growing crops having less water requirement, more intercropping, agroforestry of fruit trees, use of aerial space, small livestock, backyard poultry etc.

We measured nearly 40 environmental, economic and social parameters of these farms. Primarily, to examine the benefits accrued from the farm, we took up two important poverty-related indicators – food intake (calorie consumption) and farm income. We examined whether the IBFF was enough to feed the family of five persons throughout the year or not.

The study revealed that the model could provide the requisite calories for the family members (2400 and 2200 Kcal per person per day for men and women, respectively). The household had to purchase only a small amount of pulses and onions from the market, which was less than 5% of the total dietary need. The estimated monetary benefit from IBFF model was around Rs.75,000-80,000, of which more than 60% was secured as cash income. Though the estimation did not consider benefits from medicinal plants (saving health expenditure), recycling of nutrients and organic manure (saving cost of fertilizers), materials used for household use etc., the monetary income of the model was enough to bring the households above government specified poverty line. (Rs.41062/- per household per annum, assuming Rs.22.50/- per capita per day for rural areas).

Upscaling the model

RKMVU aimed at establishing a model village on Integrated Rural Development, conducted surveys in Paruldah village having nine village settlements. During the initial surveys conducted during 2011-12, we found agriculture as the principal livelihood option. But, this was constrained by salinity and small fragmented holdings of the farmers. Eighty eight percent of 561 households in Paruldah village belonged to Scheduled Caste and more than 50% of them were below the poverty line.



Photo: Author

A small farmer adopts an IFS model

RKMVU discussed with the farmers about their needs and preferences. Also had discussions with the local Community-Based Organization, Ramakrishna Mission Ashrama, Narendrapur (where our University's Faculty Centre is situated) which has vast experience in promoting such models in the district. This apart, experts were also consulted in arriving at a suitable, powerful intervention point. IFS models of South 24 Parganas was the obvious choice which suited small holdings and resulted in multifunctional benefits to the farm household.

Ramakrishna Mission Vivekananda University initiated scaling up of the model in 2013, with farm-specific refinements in Paruldah village. The model is developed as per the needs and resources of the household and is not a prescriptive recommendation. Besides focus on the principles of ecological farming, these IBFF models further aimed at building social capital and a conducive institutional environment.

Farmers were organized into para (hamlet) committee comprising of around 20 men and women in each project village. Farmers are selected through bi-weekly para committee meeting followed by approval in the monthly village committee meeting.

Farmer Field School was organized to a group of farmers. Farmers received training from experts and scientists on scientific cultivation of crops and their pest management. FFS members are selected through the Para and Village Committee resolutions. An assurance is taken from the host farmer to return 10% of the benefits in monetary and/or non-monetary terms (e.g. - seed, labour) to the village committee. Besides crop data, members of this network also collected meteorological data from the village resource centre

The IBFF models generated income of Rs.75,000-80,000, of which more than 60% was cash income. This was enough to bring the households above government specified poverty line.



Photo: Author

FFS members being trained in vermicomposting

where a Hygrometer and Digital rain gauge are kept and monitored by the village committee. Further, leaders/farmer-trainers of the FFS provide training to other farmers at regular intervals.

All the farmers having IFS model are members of a Seed Sharing Network. Farmers select the germplasm and maintain them through the seed sharing network. All the members, as per their need, take seed at the initial stage of their cultivation and return 20% extra seed material to the seed sharing network after harvest. Members regularly monitor the process and supervise the quality of the germplasm, which are kept in a cool and dry place inside seed bins. Presently, the seeds of vegetables and mustard have been shared and they are stored in the seed bins.

As farm surplus is small, farmers have planned to sell their produces collectively, by forming a Market Linkage Network in each of the hamlet. This is still in the initial stages. In future, the entire model may be linked to farmer producer company or cooperative.

Thus, three institutional entities namely, Farmer Field School, Seed Sharing Network and Marketing Network have been established. A farmer may be a member of all these networks, but, this is not mandatory. Even interested non-farmers of the village have become member of one or more of these institutions.

Early benefits

Though it is too early to measure the impacts, there are certain developments that indicate that there are positive results. Farmers are coming together for the first time with regular interaction through Farmer Field Schools. Important farming related information/technologies are being exchanged among farmers. For instance, two progressive farmers are freely sharing their 'hidden expertise' with FFS members. Also enthusiastic members make use of Village Resource Centre where extension literature in local language is being maintained.

The seed sharing network has saved the farmers from expending cash for purchasing seed. In the first year, farmers have saved around Rs.400-500 on an average. While it has improved the access to seeds, the seed network has helped in maintaining the local germplasm. Seeds of local varieties of cucumber, bottle gourd, leafy vegetables, chillies etc. are being preserved, as women of the farm households grow these in the homestead areas.

There is a definite increase in the incomes realised from the farm. For example, Ranjan Mondal, one of the farmers, after securing for household consumption earned Rs.8000 from 18 layer birds

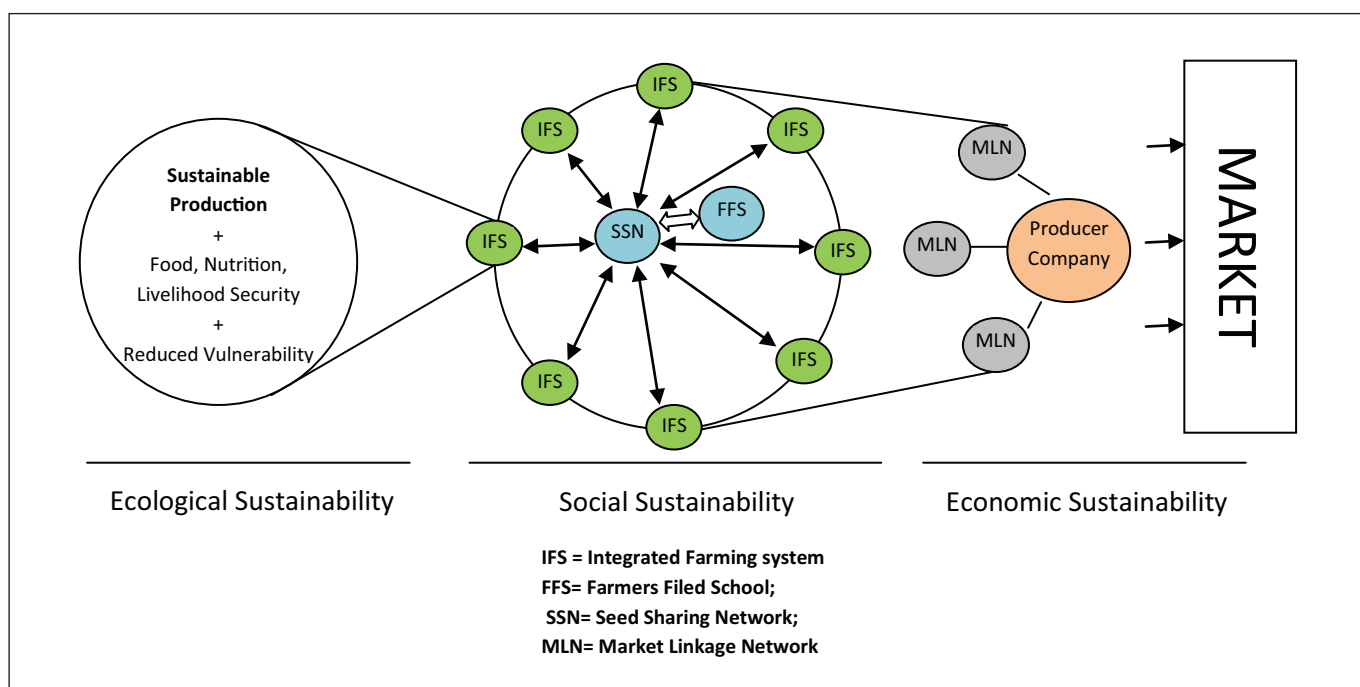


Figure 1: Linking bio-diverse integrated family farms with market

(Rhode Island), Rs.8000/- from fish, Rs.15000/- from vegetables. Last year, he had not received any income.

The dietary diversity of the households has also increased due to the intervention. Previously, the share of carbohydrate was more than 80%. Now, with the consumption of vegetables, fish and eggs, the protein and vitamin components in the diet have increased. Also farmers are able to consume pesticide free, healthy produce.

More importantly, the solidarity of farmers has enhanced. Earlier, farmers of the nine village settlements hardly sat together for regular discussions.

Future potential

Integrated Farming System (IFS) employs a unique resource management strategy to help achieve economic benefit while sustaining agricultural production and environmental quality. These systems which have the potential to address many issues like food security, employment generation and environmental stability are being promoted sporadically by NGOs. It is time to reckon these systems and implement as a unit of planning on a large scale.

Also, there is a need for various departments to work in tandem. For example, Sundarban Development Board, an autonomous body under the Sundarban Development Department of Govt. of West Bengal has promoted thousands of land shaping/excavation of irrigation tank in the Sundarbans region. A large number of such tanks have also been created under MGNREGA, a rural employment programme of the government. There is an enormous potential of improving socio-economic condition and restoring ecological balance by promoting IFS on these lands. Even with a conservative estimate of 50000 farms in the area, the potential value of primary agriculture produce will be Rs.350 crore a year,

of which Rs.125 crore will come to market directly. Not to mention the employment generated by these farms and the associated labour economy. The contribution to ecosystem services is enormous if one can estimate in terms of nutrient balance, water saved, carbon sequestered, energy saved and biodiversity enhanced. These are subjects of great practical importance and, astonishingly, no policy initiatives have been taken up to focus the same. IBFF need to be taken up as units of NRM in regional planning and be merged with the overarching poverty alleviation strategy.

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