

# Family Farms: Farm, Feed & Flourish

S. Ayyappan

Agriculture is the largest private enterprise in India, dominated by small farmers. Over 59% of male and 75% of female workers in rural areas are engaged in this sector. Seeking non-farming employment is a recent trend and about 13 million workers are reported to have changed from agriculture during 2009 to 2012. While this might raise the income of agriculture workers and reduce the disparity in income between workers in agriculture and non-agriculture sectors, it could have detrimental effects, as agriculture is still a labour-intensive activity. In this context, family farming assumes great importance for conservation as well as cultivation.

## Family Farming and Food Security

An estimated three billion people live in rural areas globally. Of these, there are about 1.5 billion men and women farmers working on 404 million small-scale farms of less than 2 hectares, between 100 and 200 million are pastoralists, 100 million are small-scale fishers, and 370 million belong to indigenous communities with a majority of them engaged in agriculture. China and India alone, account for 193 million and 93 million small farms, respectively. Family farming has diverse dimensions in terms of food production, income generation, equity, entrepreneurship and environment and is the predominant form of agriculture in the food production sector, both in the developing and developed countries.

The women and men engaged in family farming produce 70% of world's food, and generate food and income for hundreds of millions of rural people, both within the family farms and in related enterprises. Family farms provide for preservation and sustainable use of natural resources, that distinguishes them from largescale specialized farming. The diverse agricultural activities of family farms promote environmental sustainability, conserve biodiversity and contribute to healthier and balanced diets. From generation to generation, family farmers have transmitted knowledge and skills, preserved and improved practices and technologies that can

support agricultural sustainability. Using innovative techniques like farming terraces and adopting zero-tillage practices, they have succeeded in maintaining the production even on marginal lands. Over the centuries, they have used their experience and wisdom to select plants and animals with desirable traits of disease resistance or improved farm productivity and quality. The indigenous landraces are cultivated and their seeds are being preserved for generations. The family farmers, besides enriching agro-biodiversity, are also custodians of rich genetic resources, and thus help in conservation efforts.

Realizing the important contributions that family farming is making towards food security and eradicating poverty, the year 2014 has been declared as the 'International Year of Family Farming' (IYFF) at the 66<sup>th</sup> Session of the United Nations General Assembly. The IYFF aims at promoting international awareness, builds on existing country and/or regionally led initiatives and strengthens contribution of family farmers and smallholders for sustainable development.

Although family farming has contributed immensely towards enhancing agricultural production and reducing rural poverty, it is experiencing daunting challenges due to globalization and trade liberalization, as is evident that they apply more strongly to small farms. For example, small farmers cannot take advantage of higher food prices by expanding production, as they have difficulty in accessing services and credit. Climate change is another challenge, which would have adverse impacts on food security and living conditions of family farmers. They would face an immediate and ever-growing risk of crop failure, loss of livestock, and reduced availability of marine, aquaculture and forest products. Farming families often have poor access and control over markets and market information, and weak bargaining power for the prices of their produce. In the last few years, volatility of food prices has compounded the situation. The farming families are more vulnerable to risks and severity of disasters like flood, drought, unusual rains, soil erosion, insects, pests, diseases and epidemics. Another issue with family farming is the reduced family size. The elderly stay home, while younger generation seeks jobs outside farms, as they do not earn enough through food processing and handicrafts.

Women farmers are not only the custodians of the environment but also play a vital role in helping produce food as well as in providing nutritive food to the family. They are involved in natural and genetic conservation efforts from seed selection to planting, harvesting, storage and processing. Yet, their contribution is undercounted and most of the agricultural policies

and programmes are not sensitive to their needs. Women lack control over land, access to markets, education and a political voice in farmers' organizations and in government bodies. They often face gender-based discrimination in household and society alike.

## Family farming in India

The contribution of small farmers to total farm output in India exceeds 50%, while they cultivate 44% of land. Small farmers are the ones who have lesser capital but higher use of labour and other family-owned inputs, and usually have a higher index of cropping intensity and diversification. Family farms grow a wide variety of cultivars, many of which are landraces. These landraces are genetically more heterogeneous than modern varieties, and thus would offer greater resilience against vulnerability and enhance harvest security in the midst of diseases, pests, droughts and other stresses. The diversity in farming, crops and livestock, often results in higher productivity than the large farms practising usually monoculture.

The livestock form an integral component of sustenance for small and marginal farmers, especially in difficult agro-climatic regions. In arid areas where droughts are common, the livestock lend sustainability to rural economy. The diverse activities contribute to food basket, nutritional security and household income of farmers and play a significant role in generating gainful employment in rural areas, particularly among the landless, small and marginal farmers and women. Marginal, small and semi-medium operational holders (area less than 4 ha) own about 87.7% of livestock and hence, development of livestock sector would be more inclusive. The output value from livestock sector in India is about 25% of the agricultural sector.

In economic terms, family farming is identified with specific entrepreneurial skills, business ownership and management, choice and risk behaviour, resilience and individual achievement. Family farming is often more than a professional occupation, as it reflects a lifestyle based on beliefs and traditions about living and work. It ensures food security even while meeting rising societal expectations for food safety, quality, value, origin and diversity of food. It also maintains rural lifestyle and contributes to socio-economic and environmental sustainability of the rural areas. Family farms have an inherent capacity for quick production expansion and key to sustainable food production, if given an appropriate policy environment.

## Is 'small' beautiful?

The ninth census by the Ministry of Agriculture in 2010-11 defined an 'agricultural holding' as the economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes, regardless of title, legal form or size.

*How small is 'small'?*: The total number of operational holdings in the country were 138 million in 2010-11, and the average size declined to 1.16 ha from 1.23 ha in 2005-06, the land holding size was 1.33 ha in 2000-01. This decline in size led to smaller size of the holdings and more clusters per holding. The percentage share of female operational holders is 12.79. Small and marginal holdings taken together (below 2.0 ha) constitute 84.97% of the total holdings (70% in 1953-54) forming 44.31% of the total operated area up from 16.3% in 1953-54 (Table 1). Semi-medium and medium operational holdings (2.0 ha–10.0 ha) constitute about 14.30% of the total holdings with 44.77% of the total operated area, and the large holdings (10.0 ha. and above) constitute 0.73% of the total number of holdings with a share of 10.92% in the total operated area (Agriculture Census 2010-11). Thus, it can be seen that 85% of the farmers cultivate about 44% and 15% farmers cultivate 56% of the operated area. Small and marginal farmers, although, have higher productivity from small holdings compared to large sized holdings, have low marketable surplus and profit.

To ensure livelihood security of the marginal and small farmers, it is necessary to focus on the technological needs and infrastructure, including diversifying avenues for gainful employment in the non-farm sector. The estimates indicate that small and marginal farmers may account for more than 91% of farm holdings by 2030. Continuously declining farm size gives rise to concerns for the very sustainability of the small farm.

Several studies during 1970s and 1980s concluded that farm size and productivity were inversely related, and small farmers were more productive than large farmers. However, based on the experience of western countries and development models, it is widely believed that this superiority of the smallholders cannot be sustained in the long run. As per capita income rises, economies diversify and workers leave agriculture and wage rates go up. It then becomes more efficient to have progressively large and more mechanized farms. Many of the advantages of small holders reduce as countries develop and become more efficient to have progressively large and more mechanized farms. This type of change has been experienced in western economies where economic

**Table 1.** Number and area of operational holdings by size group

Category of Holdings	Number of Holdings				Area			Average Size of Holdings		
	2000-01*	2005-06*	2010-11	2000-01*	2005-06*	2010-11	2000-01*	2005-06*	2010-11 (P)	
	2	3	4	5	6	7	8	9	10	
Marginal (Less than 1 hectare)	75408 (62.3)	83694 (64.8)	92356 (67.0)	29814 (18.7)	32026 (20.2)	35410 (22.2)	0.40	0.38	0.38	
Small (1.0 to 2.0 hectare)	22695 (19.0)	23930 (18.5)	24705 (17.9)	32139 (20.2)	33101 (20.9)	35136 (22.1)	1.42	1.38	1.42	
Semi-Medium (2.0 to 4.0 hectare)	14021 (11.8)	14127 (10.9)	13840 (10.1)	38193 (24.0)	37898 (23.9)	37547 (23.6)	2.72	2.68	2.71	
Medium (4.0 to 10.0 hectare)	6577 (5.5)	6375 (4.5)	5856 (4.3)	38217 (24.0)	36583 (23.1)	33709 (21.2)	5.81	5.74	5.76	
Large (10.0 hectares and above)	1230	1096	1000	21072	18715	17379	17.12	17.08	17.37	
<b>All Holdings</b>	<b>119931</b> <b>(100.0)</b>	<b>129222</b> <b>(100.0)</b>	<b>137757</b> <b>(100.0)</b>	<b>159436</b> <b>(100.0)</b>	<b>158323</b> <b>(100.0)</b>	<b>159180</b> <b>(100.0)</b>	<b>1.33</b>	<b>1.23</b>	<b>1.16</b>	

Source: Agricultural Statistics at a Glance-2013

No. of Holdings: ('000 Number)  
Area Operated: ('000 Hectares)  
Average size: (Hectares)

transformation has been associated with increase in size of holdings with a near wipe out of smaller farms. However, concentration of smallholders has remained high in Asia, with average farm size even in Japan, a developed country, Korea and China, remaining below 1.2 hectares. The experience of China is particularly interesting for India. China continues to have much lower size of land holdings than India but its agricultural productivity and growth are significantly higher than India.

## **Technological empowerment for family farming**

The National Policy for Farmers (2007) of the Government of India defines 'Farmer' as 'a person actively engaged in the economic and/ or livelihood activity of growing crops and producing other primary agricultural commodities' and will include all agricultural operational holders, cultivators, agricultural labourers, share-croppers, tenants, poultry and livestock rearers, fishers, beekeepers, gardeners, pastoralists, non-corporate planters and planting labourers, as well as persons engaged in various farm-related occupations such as sericulture, vermiculture, and agroforestry. The term also includes tribal families /persons engaged in shifting cultivation and in collection, use and sale of minor and non-timber forest produce. One of the intents of the policy is to improve economic viability of farming by substantially increasing the net income of farmers and to ensure that agricultural progress is measured by advances made in their income.

Increase in productivity and area (number in case of livestock) are the two sources of growth in domestic production to meet future demands. As there is little scope for horizontal expansion of area under cultivation, vertical expansion is possible through increased cropping intensity. This can be achieved by developing crop varieties that are of short duration, can be grown under moisture stress, and are tolerant to climatic conditions of lean period during which agricultural land remains fallow. In this context, it is important to develop technologies that can enhance productivity by raising input use efficiency and by reducing risks of crop failure and yield loss.

Farmers require appropriate and authentic advice based on meteorological, marketing and management information for land-use decisions and investments. Infrastructure support would be needed to minimize post-harvest losses and enable agro-processing and value-addition in the villages to enhance employment and income. Farmers' organizations and other entities like small farmers' estates need to be encouraged, so that farmers get a fair deal and enjoy economies of scale. Producer groups

and cooperatives have to be strengthened to promote agro-processing industries.

The production environment being highly variable in India, all forms of agriculture need to be dealt with distinctly so that most suitable, efficient and profitable agricultural production technologies are promoted specific to production conditions in a given environment. Specific advantages of agro-ecoregional approach for research planning are: better identification of production constraints and research needs; better targeting of prospective technologies; improved assessment of farmers' responses to new technologies; and wider adoption and larger impact of research outputs.

Researches in the Sustainable Rural Livelihood component of the ongoing National Agricultural Innovation Project (2007-2014; Component 3) laid emphasis on most suitable farming systems and allied off-farm activities in less favourable environments, regions and groups, so that livelihood of the rural poor improves through assured food, nutrition, employment and income, while ensuring sustainability of socio-economic and natural resources. Particular attention was given to rainfed, hill and mountain, and coastal and island eco-regions. The technologies developed under the component could be adopted either by a farmer individually or collectively by a group of farmers involving farm men and women, the farm labourer, the input supplier, the rural industry entrepreneur or the researcher.

## How to make 'small' beautiful?

The success or the failure of the small farms is determined strongly by policy environment and access of farmers to inputs and information. Categorization of farms according to the scale of operation, particularly those in the household sector, is important for formulating appropriate policies for each section of the farming community. A differentiation is needed in the treatment, and hence in choice of policy instrument, of different categories of farmers due to their differences in resource endowment, inputs use pattern, source of farm labour, use of output and market access.

*Increasing fragmentation:* Shrinking agricultural land is a stark reality. The per capita availability of agricultural land has declined from 0.48 ha in 1951 to 0.16 ha in 1991, and is likely to reduce further to 0.08 ha in 2035 and even less by 2050 due to growth in human population and infrastructure required for tourism, transport, industry, mining, etc. Smaller size of farms results in wastage and inefficient use of costly inputs. A considerable area of fertile land is lost while demarcating farm boundaries. The newly created farms require fresh efforts to plan out farm layout, as division of

farms continues from generation to generation, thus raising a question about the ultimate sustainability of a small farm.

*Natural resource degradation:* The total area in the country affected by different forms of land degradations is over 121 mha, of which 105 mha fall under arable land and 16.53 million ha under open forest. To restore and maintain land suffering from such disorders would be a challenge, that needs immediate and long-term attention with requisite ameliorative measures. Reclamation and rejuvenation of vast stretches of land with appropriate technological interventions is the way forward for ensuring livelihoods of millions in these areas.

*Enhancing resource-use efficiency:* The current levels of efficiency of natural resources (water, bio-energy, plant and animal residues) and man-made inputs (fertilizers, pesticides, fossil energy) are rather low. For instance, fertilizer use efficiency ranges from 30-50% for N, 15-20% for P, 8-10% for S, 2-5% for Zn, 1-2% in case of Fe and Cu. Furthermore, when resources and inputs are used inefficiently, both cost of cultivation and threat to biosphere pollution increase, and consequently the production decreases. This has received the attention of the researchers and policy makers alike.

*Access to quality inputs:* Productivity enhancement, post-harvest management and value addition are critical for ensuring sustainability and increasing farm income and profitability. Timely availability of quality inputs, particularly the seed and planting material, fertilisers, or the feed and fodder in case of livestock, has been a matter of concern for the small farmers.

*Small farm mechanization:* Acute labour shortage and rising cost of agricultural production have brought engineering inputs in agriculture into focus. Timeliness, precision and resource conservation in farm operations are of utmost importance to realise potential yields of technologies. In this context, gender-friendly tools for reduction in drudgery of farm workers, improved machinery such as self-propelled sprayers, precision seeders and planters, transplanter for rice and vegetable seedlings, multi-crop threshers, harvesters for cereals and sugarcane, etc. have gained acceptance. For such farmers and farm lands, low-cost, light-weight, multi-purpose farm equipment are needed. Therefore, mechanization of small farms is the need of the hour, along with efficient energy management.

*Enhanced energy usage:* The structure of energy consumption in Indian agriculture has changed and there is a need for introducing technological change involving energy-efficient farm machinery and irrigation system. Use of non-conventional and renewable sources of energy in agriculture is urgently required. Smaller the farm, greater is the need for marketable

surplus, so that small farmers are ensured with a sound income. Achieving this goal will be possible only if we develop and disseminate eco-technologies rooted in principles of ecology, economics, equity and employment generation.

*Post-harvest management:* It is estimated that present levels of post-production losses are about 2.8-10% in durables, 6.8-12.5% in semi-perishables and 5.8-18% in perishable products. Huge wastage across the supply chain leads to lower level of processing and hence low value-addition. About 50% of these losses can be prevented using appropriate post-harvest measures. Establishing on-farm primary processing facilities would capacitate small farmers in a big way. The family farmers can be trained to undertake post-harvest processing and packaging of farm produce, preferably onfarm or near to the production site. Such technologies would promote entrepreneurship in rural areas by strengthening forward linkage in agriculture. This would generate additional working days to farm family members, add value to harvest and generate additional income. Appropriate and cost-effective packaging technologies for these items are needed to ensure safe transportation.

*Farmer to Agripreneur:* Small farmers, in general, are faced with resource constraints, especially the poor or weaker sections. Such farmers can be organized into groups for resource sharing or as commodity-based and market-orientated groups. The farmers can thereby, make agriculture more viable by sharing input costs, machinery rentals, cutting down on transport costs, getting better banking deals and marketing linkages. Our approach should be to promote diversification to enhance income and employment, minimize risks and allow efficient and sustainable use of natural resources' community-based approaches as means to address poverty and livelihood as well as facilitate integration of disaster-risk reduction, development, and climate change adaptation.

*Technology dissemination:* Frontline demonstrations at farmers' fields and at experimental farms show that productivity of crops, livestock and fisheries at the farm level can significantly be enhanced by adopting already developed improved technologies and practices. More far-reaching, participatory information and communication technologies need to be developed to effectively link research accomplishments with stakeholders. The farmers need to be sensitised about the whole range of agri-business, production systems, research institutions, programmes and schemes of the development departments, open markets both at domestic and global scale, and other partners, to be provided through training, demonstration, literature, and other human resources development support, including interface at different levels.

*Linking farmers with markets:* The smallholder farmers face challenges and opportunities of a rapidly changing market environment brought about by trade liberalization and globalization. Smallholders often have limited access to markets for both inputs and outputs, and this has a significant effect on their production activities. The efforts towards regulated markets have helped in mitigating market handicaps of producers/sellers at the wholesale assembling level. However, the rural periodic markets, in general, and the tribal markets in particular, remained out of its developmental ambit. Smallholders, due to their small surpluses in production, generally are exposed to high degrees of risk and transaction costs. There is a need for promotion of agro-processing centres in rural sector/production catchments for value addition of agricultural produce including technological back-up support. Appropriate strategies will have to be worked out to address issues relating to marketing/infrastructure required, the most immediate need being development of local transport network. This linkage could help smallholders augment their income and deal with shocks, while they acquire the skills to undertake more productive activities. Direct marketing through SHGs or informal groups, NGOs, cooperatives, Farmers Associations, Companies, partnerships, joint ventures need to be encouraged. Farmer Producer Organizations (FPOs) are a way forward in this context.

*Enabling policy framework:* A clear policy on land use in the country is required. As the population grows, agriculture will face competition for land and water resources from non-agricultural sector also. Diversion of prime agricultural land for non-farm uses needs to be discouraged. Since land is a state subject, the states need to formulate and enact appropriate legal framework and institutions in place to protect prime agricultural land from being lost. Poor credit flow to agriculture and wholesale trade has been one of the bottlenecks in the country's agricultural marketing system. Most of the lending to the agriculture sector is short-term, and is in the form of crop loans. Moving from subsistence to more commercially oriented activities require increased capital and investment flow, which would focus on smallholder farmers and their specific constraints and needs during times price stability and volatility. Capital flows towards rural areas need to be improved and innovative institutional models of financial institutions need to be put in place.

*Research needs:* The overarching concerns of nutritional and livelihood security, poverty alleviation, profitability, gender equity, ecology and environment, and competitiveness in terms of cost and quality are major researchable issues before the NARES. Priority issues that call for attention include availability of water and its quality, soil health, genetic resource

conservation, insulating farm production against increasing biotic and abiotic stresses, managing climate change, enhancing input-use efficiency, energy management, diversification, and post-harvest management. Investments in agricultural R&D and rural infrastructure have resulted in high rates of return. In the tenth five-year plan, the expenditure on agricultural research and development as percentage of agricultural GDP was 0.59% and in eleventh plan it was 0.70%. There is a need to raise it to a level of at least 1% urgently and ultimately to a level of 2%.

*Family Farms as Future Source of Manpower for Agriculture:* Indian economy has now reached a stage where labour has started moving out of agriculture in a big way, and workforce in agriculture has started falling in absolute terms. Though this is considered a positive change from economic transformation point of view, it has implications for agriculture. Agriculture remains a labour-intensive activity and hence, serious constraint on the labour availability and high wage rates affect levels of output. The only way to cope up with this change in labour composition is to retain required workforce with family farms in farming. It is interesting to point out that a shift of workers from households self-employed in agriculture is much slower than shift of workers from rural labour household to non-agriculture. Obviously, family farms are less inclined than labour households to leave farming activities. Family farming provides for, besides economics, inheritance of traditional knowledge, conservation and benefits to environment. Presently, there is an opportunity to make agriculture more attractive, exciting and rewarding for family farms so that self-employed workers in agriculture do not move out to non-agriculture under distress. The approach hence for 'Family Farms' is to 'Farm, Feed & Flourish'.

## Literature

In writing the paper, information has also been sourced from the official publications/reports of the Ministry of Agriculture, Government of India; Food and Agricultural Organisation (FAO) of the UN; CGIAR and ICAR institutions, available in the public domain. Some of these include All India Report on Number and Area of Operational Holdings: Agriculture Census Division; National Policy For Farmers (2007); Agricultural Statistics at a Glance-2013, Ministry of Agriculture, Govt. of India, New Delhi; FAO documents on [www.fao.org/family-farming-2014](http://www.fao.org/family-farming-2014); Policy papers of National Centre for Agricultural Economics and Policy Research (ICAR), New Delhi.

\*\*\*\*\*

