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APPROACH TOWARDS CAPACITY BUILDING OF FPOS ON FAST TRACK MODE: IN PUNJAB

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ABSTRACT

The focus of the paper is on exploring avenues for increasing value accruals to farmers. Basically, in the context of producers, the need for evolution of Farmer Producer Organisations (FPOs) to reduce the exploitation by middle-men traders is apparent. The interventions being undertaken under the aegis of FPOs in different value chains and locations intervene on both forward and backward segments of the chain. Basically, the objectives of the producer companies are to: undertake various activities such as bulk purchase of inputs and delivery to farmer members; marketing of produce, grading and quality control and first level processing; procurement and maintenance of farm equipment for hiring out among farmers. The case illustrations considered in this paper present the setting in well performing FPOs offering a wide mix of services and earning high annual revenues as well as upcoming producer networks just graduating into providing a range of services. The benefits being accrued to member farmers range from considerable cost saving in sourcing inputs like seeds and fertilisers as well as larger net value accruals through marketing directly to end-consumers or national or global retailers. In essence, the paper validates the intervention approach of focus on FPOs as a means to provide various scale economies to small and marginal farmer stake-holders. It also reflects the option of financing the capacity building and establishment of common facilities by such networks that agglomerate produce by means of matching grants in PPP mode. Further, it validates the need for a business development service providing platform, namely an Agri Business Promotion Facility, to provide a range of services including: the evolution of producer networks; facilitating management and technical training of such networks; providing guidance on the preparation of bankable business plans; linking networks with technology and equipment and credit related service providers; channelling links with apt markets and marketers; and providing a range of other capacity building and networking services to consortia of farmers or FPOs to enable them to move up the value chain, eliminate rent seeking middle-men even while adding value to produce. Such interventions alone will enable the relatively deprived sections of the Punjab economy to integrate with the mainstream.

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FPO development approach: Stages

The World Bank had initiated FPO development approach through a co-ordinating platform namely Agri Business Promotion Facility (ABPF). Leading consultancy firms like Grant Thornton are playing this role in states like Maharashtra, Rajasthan and Punjab. Essentially, the FPO development approach in this context may be viewed as depicted in figure-1.

Fig.1: Stages of FPO Development

Cluster and FPO identification: Under this activity, cluster areas are selected by the ABPF typically in consultation with the respective State Government departments. It needs to be ensured that a network of about 300-500 farmers are evolving as members of related FPOs in these areas.

Diagnostic study: Diagnostic study is conducted by the ABPF in selected cluster areas to assess the preliminary situation of farmers and the level of agriculture output in the catchment area. The study will also help identify the potential interventions that need to be implemented.

Feasibility analysis: Feasibility analysis for the formation of FPOs is carried out by Agri Business Promotion Facility (ABPF) and then appraised by value chain/ industry. A normal feasibility study covers aspects such as financial, technical, legal, political, socio-cultural, environmental and economic and resource feasibility.

Business planning: Business planning is carried out by the ABPF with the help of selected farmers' representatives.

Business operations: Business operations is the commencement of procurement, production, processing, marketing and other service activities of a FPO. ABPF trains both the governing and operational structures of the FPO in order to ensure smooth functioning of business operations.

FPO development model: The ABPF will ensure that FPOs will offer a variety of services to its members. This may cover almost all aspects of cultivation and primary/secondary processing (from inputs, technical services to processing and marketing). The FPOs will facilitate linkages between farmers, processors, traders, and retailers to coordinate supply and demand and to access key business development services such as market information, input supplies, and transport services.

An indicative list of services includes the following.

Input supply services: The FPOs may channel low cost and quality inputs to member farmers. It will supply fertilisers, pesticides and seeds.It may also facilitate custom hiring of equipment and encourage seed cultivation.

Procurement and packaging services: The FPOs may procure agriculture produce from its member farmers; facilitate storage, value addition and packaging.

Marketing services: The FPOs may undertake direct marketing after procurement of agricultural produce. This may help members to save in terms of time, transaction costs and weighment losses and not suffer on account of distress sale and price fluctuations.

Insurance services: The FPOs may channel various insurances like crop insurance, electric motors insurance, etc.

Technical services: FPOs may promote best practices of farming, maintain marketing information system, diversifying and raising levels of knowledge and skills in agricultural production and post-harvest processing.

Networking services: Making channels of information (e.g., about input sourcing, custom hiring of equipment and product specifications, market prices) and other business services accessible to producers; facilitating linkages with financial

institutions, building efficient linkages of producers, processors, traders and consumers and facilitating linkages with various government programmes.

Promotion of FPOs across the globe

Developed as well as the developing countries across the globe have been promoting FPOs for decades. Some of the more noteworthy among them are discussed below.

Europe

In Europe, development agencies and the state have initiated a joint stock company model involving non-producers also to tackle the problem of resources for scale up and market connectivity. Here, a part of the equity of the FPO is held by non-producers. One such company "Agrofair" in Europe is into fresh fruit import and marketing including fair trade bananas with turnover of Euro 16 million and it is one of the major suppliers to European supermarkets (Koning & Pieters 2009).

Ghana

In Ghana, Farmapine Ghana Limited represents pineapple growing cooperatives which own 80 per cent shares of the company and the rest with two former pineapple exporters. The network has been able to increase the exportable fruit from 30 per cent to 45 per cent of the total at the farmer level within two years. Similarly, in Ghana again, a farmer owned cocoa buying company - Kuapa KoKoo Limited (KKL) - was set up with support from Twin Trading (Singh & Singh 2014). Twin UK membership includes 24 farmer cooperatives from many countries.

Denmark

Denmark has a large number of organisations known as "dairy companies" which work on cooperative basis. They are given concessions under tax laws and the Companies Act. By-laws of organisations should provide that the company's aim is to benefit producer members and that financial surpluses are distributed according to patronage/turnover. They collect most of the total milk delivered in Denmark.

New Zealand

New Zealand Dairy Co-operative Companies (CCs) are well organised and manufacture the entire range of dairy products and have 100 per cent share in the milk products market. The government exempts profits distributed to suppliers or

transferred to reserves from taxation. CCs are a non-profit mutual organisation and, therefore, tax incidence is only at the level of individual producers (Dubey 1994).

Sri Lanka

In Sri Lanka, farmer companies are investor-owned companies established under the Companies Act as "people's companies" registered with the Registrar of Companies and follow rules and regulations of a private company. They are registered with minimum 50 members to safeguard against possible private ownership by imposing restrictions on membership and share trading.

Status of FPOs in India

The rural populace around the globe have limited access to markets directly, which affects their livelihood incomes adversely. Lower population densities, poor market connectivity and low bargaining power affects the rural producer (Bosc et al. 2001). Limited price stabilisation measures, the opening up to imports, dismantling of subsidies for inputs in the rural sector have worsened the conditions of small and marginal farmers. One major cause is that 85 per cent are small and marginal farmers with land holding of 1.33 hectares per farmer household. Due to this fragmentation,farmers do not have the wherewithal to modernise production or processing technology nor use high yielding varieties of inputs like seeds and fertilisers (Anonymous 2015). Therefore, they need to be integrated (Vadivelu & Kiran 2013) into FPOs. Basically, an FPO is a typical society, a cooperative, or a company that promotes the interests of farmers. An FPO provides services that support producers in their activities. Considering these services, there is a need for aggregation of produce and producers in order to benefit from economies of scale in production and for farm mechanisation and optimising the sourcing of farm inputs. Aggregation is also needed for sharing services such as post-harvest, storage, processing and transportation, and to offer produce to the market directly in required volumes. They also enable producers to progress into value adding and operation optimising activities such as input supply, credit, processing and marketing. The FPOs are increasingly argued to be the means to enable small and marginal farmers them participate successfully in regional, national and global value chains (Trebbin & Hassler 2012). Producers' organisations also help in evolving social capital and collective efforts and de-centralised governance framework.

The exact number of FPOs and producer companies (PCs) in India is yet to be ascertained. Some studies indicate that there were over 156 PCs in India as at mid-

2011 which grew to 879 by 2015. Presently, there could be over 1,500 PCs operating in India as Small Farmer's Agricultural-Business Consortium (SFAC) alone has evolved over 700 PCs and the World Bank- Maharashtra Agricultural Competiveness Project (WB-MACP) initiative works with over 440 PCs. Including other legal forms, several thousand FPOs are certainly in operation in India.In India, PCs were originally promoted and supported by a state government (Madhya Pradesh) under a World Bank (WB) poverty reduction project since 2005 and thereafter (since 2011) under similar projects in states like Maharashtra. Such initiatives are also on in states like Rajasthan and Himachal Pradesh.

Illustrations from FPO Development approaches: Punjab

Badal honey bee producer Co-op. industries society ltd., Muktsar

The Badal Honey Bee Producer Co-op Industries Society Ltd. in Muktsar has already graduated from producing to processing honey in other firms on job-work basis.

Basically, honey is made by bees foraging nectar from flowers. The colour and flavour of honey differ depending on the bees' nectar source (the blossoms). Lighter coloured honeys are mild in flavour, while darker honeys are usually more robust in flavour. Honey bees convert nectar into honey by a process of regurgitation and evaporation. They store it as a primary food source in wax honeycombs inside the bee hive. Some of the various varieties of natural honey are rapeseed / mustard honey, eucalyptus honey, lychee honey, sunflower honey, acacia honey and wild flora honey.

Preparation of good quality honey starts in a bee yard. The bee should be produced in separate honey super, and not in combs used for rearing brood. Moisture content is the major factor which determines the keeping quality of honey by Niir Board (2000). The optimum humidity for maintaining 17.8 per cent moisture content in honey is about 60 per cent. The processed honey is filtered under pressure. Honey should be stored in dry places as it readily absorbs moisture. Uncapping is the first real step of honey processing. It consists of the removal of the thin wax layer that seals the honey cells. The extraction temperature should not exceed 30°C. Extracted, cleaned or purified honey is ready to be consumed directly (Krell 1996).

The processing of honey requires procedures such as liquefaction, pre-heating and straining, micro-filtration, inactivation of yeast cells (processing), vacuum evaporation and cooling of honey. The raw honey is to be heated first at 40-45°C (approx.) for 30 minutes. with constant stirring at a rate of 50 rpm to make it

homogeneous. Honey pre-heated at 40-45°C (approx.) is filtered through 80-100 mesh (40-50 micron) so as to separate solid wax particles, pollen grains and other foreign materials. Pressure should not exceed 1.5 kg/cm^2 during filtration. Otherwise there is a chance of air mixing with honey. Temperature of honey should be maintained between 60 -65°C (approx) for 20 or 15 min respectively. Processed and cooled honey is allowed to settle at 25° to 30°C (approx.) to separate the foam / scum at the top and clear liquid at the bottom. The foam/ scum can be removed by scooping manually.

The demand for honey is significant and growing. In fact, the per capita consumption of honey in India is just 8 grams, whereas in Germany it is 1,800 grams. About 16 lakh people are directly or indirectly engaged in bee keeping and allied activities. The leading producer of honey is China with 450,300 MT. The second and third largest producers, Turkey and Argentina produce 94,694 and 80,000 tonnes respectively. By 2013, India emerged as the seventh largest producer of honey in the world, following Mexico. The US continues to be the topmost importer of honey in the world. Other major importing countries include Germany, Japan, UK, France, Italy and Spain. India has exported 38,177.08 MT of natural honey, worth Rs. 705.87 crore during 2015-16. In India, West Bengal stands in the first place with 15.50 ('000)MT, followed by Punjab13.80 ('000)MT and Uttar Pradesh 13.50 ('000)MT.

In fact, in Punjab, there are over one lakh bee colonies with average production potential of 20-25 kg /year/colony. About 10,000 colonies are thriving in Haryana. The important bee floras in Punjab are oil seeds (rapeseed, mustard and sunflower), eucalyptus and Egyptian clover. Punjab has assured irrigation and good flora, and hence has the capacity to maintain 10 lakh honey bee colonies. Punjab today contributes 25 per cent of the total honey produced in the country and its 23,000 bee keepers export nearly 3,000 tonnes of honey annually, worth Rs.15 crore, to countries like USA, the UK, other countries of Europe, and the Middle East. This export is part of a total production of approximately 5,500 tonnes produced by 2.5 lakh Italian honey bee colonies. Punjab exports bee wax also.

The Badal Honey Bee Cooperative Society, located in village Badal of Muktsar district of Punjab, is a venture set up by the extensive collective efforts of more than 220 farmers and agriculture technocrats with the objective of self-marketing, and to process farm produce. This FPO plans to establish a CFC for honey processing. It is already making a turnover of Rs.1.25 crore. The FPO is already functioning for several years. It is collecting raw honey from not only Punjab but also Bihar,

Maharashtra, Rajasthan, Srinagar, West Bengal and Uttar Pradesh. Following the traditional honey processing set-up, they have been able to serve only the domestic market. The quality of processed honey being below export level, has garnered the cooperative marginal profit, as the exporters and the middle men take away the chunk of the profits. In this context, in order to replace these middle men and earn higher margins the cooperative has taken the initiative to set up an advanced honey processing facility which would deliver the honey of export standards.

To elaborate on the technology of honey processing, honey produced by Indian bees is collected by modern extractors. Once the heating step is completed it will then go through a moisture evaporation process. Remaining at 70°C, the honey is exposed to vacuum to aid in the evaporation of excess moisture. After the sugar crystals have been liquefied and excess moisture has been removed, the honey then goes through a filtration process. This is done by sending the honey through a self-cleaning wedge-wire stainless steel cartridge at 200μ to filter out any yeast spores within the honey. This process helps increase the time the honey can be stored in between each process, allowing the UMF of the manuka honey to mature. Once honey has exited the filter it is sent through to a crystallisation tank where the honey is suitably agitated to ensure there is no air incorporation within the product. Then the filtered honey is packed into bottles of various sizes through automatic filling, packing and sealing machine. There is also provision for establishment of an effluent treatment plant with transfer pump. There is also provision of RO based water treatment plant with reverse osmosis for fulfilling the water requirement in the process.

While over 220 farmer-producers of Badal Honey Bee Cooperative Society are already directly contributing to the equity of this proposed honey processing facility, who will be the beneficiaries, the facility will also be open for use by non-members. Thus, hundreds of small and marginal farmers will be benefited. Importantly, the envisaged common facility will help the existing farmers move up the value chain to competitively produce quality value-added products. The envisaged project would have a project cost of Rs. 276.15 lakh, which includes: contribution of FPO (Rs. 27.61 lakh), bank term loan (Rs. 55.23 lakh), grant-in aid from the GoI (Rs. 138.07 lakh) and grant-in aid from the GoP (Rs. 55.23 lakh).

The proposed CFC could also progressively facilitate the bulk purchase of inputs and delivery to farmer members; marketing of produce, grading and quality control and first/second level processing. It would let farmers to realise higher price for their produce through aggregation and sales. There is an expected turnover rise to member

farmers from CFC activities to Rs. 2.25 crore in the medium-term. The CFC could help cluster farmers even double the income levels and value accruals. Besides, the envisaged common facility will help the existing farmers move up the value chain. It will also help contribute towards regional industrial and economic growth.

As part of related capacity building interventions, the Agriculture Business Process Facilitation (ABPF) has provided training inputs to the Board of Directors (BoDs) of the FPO to enhance their entrepreneurial skills and business acumen. The ABPF has also provided them handholding support for preparation of a bankable business plan for the proposed honey processing unit. The FPO has already been linked to various market players like Punjab Small Industries & Export Corporation.

Farm produce promotion society (FAPRO, Hoshiarpur)

A CFC is envisaged for turmeric processing as well as for cleaning, grading and sorting of pulses for the agricultural project formulation and analysis programme (FAPRO), a FPO located in village Ghugaul of Hoshiarpur district, Punjab. FAPRO is a venture set up with collective efforts of more than 354 farmers and agriculture technocrats with the objective of self-marketing and processing the farm produce. They intend to expand their existing infrastructure to include dal mill and turmeric processing. The dal mill would process raw pulses like tur, pigeon pea, Bengal gram, black gram, chick pea and green gram. Pigeon pea contributes about 20 per cent to the total production of pulses in India. India is the largest producer of pigeon pea in the world and contributes more than 60 per cent of the total world production. In this context, Bengal gram accounts for nearly 40 per cent of total pulse production in India.

Turmeric is an important commercial crop of India and is also famous as "Indian saffron" because of its yellow colour. Turmeric is classified as part of Indian culture as an important ingredient in curry dishes; used in many religious observances, as a cosmetic, a dye, and for many traditional remedies. India is the largest producer, consumer and exporter of turmeric. The global production of turmeric is estimated at around 6 to 7 lakh tonnes. The main turmeric producing states in India are Andhra Pradesh, Tamil Nadu, Odisha, Karnataka, West Bengal, Gujarat and Kerala. The processing of turmeric includes curing, drying, polishing and colouring. Curing involves boiling of fresh rhizomes in water and drying in the sun. The cooked fingers are dried in the sun by spreading them in 5-7 cm thick layers on bamboo mats or drying floor. The yield of the dry product varies from 10-30 per cent depending upon the variety and the location where the crop is grown.

Indian turmeric industry contributes about 78 per cent of world production and 60 per cent of the exports of turmeric. United Arab Emirates is the major importer of turmeric from India accounting for 18 per cent of the total exports, followed by USA with 8 per cent. India exported about 80,000 tonnes of turmeric in 2012-13. Turmeric is shipped in the form of dry turmeric after polishing, fresh turmeric, turmeric powder, dehydrated turmeric powder, oils and oleoresins.

The FPO is registered as a society under the Societies Act 1860 in the year 2001 and has therefore several years of successful experience in procurement, processing and marketing activities. FAPRO has set up processing plants of turmeric and honey in 2008 under Rashtriya Sam Vikas Yojna (R.S.V.Y) scheme of the GoI. The working capital for running and maintaining the processing plant was contributed by FAPRO members themselves. Now, FAPRO is successfully operating a system comprising production, processing and self-marketing for diverse farm produces. The society which is already operating plants of turmeric and honey since 2008, is now in expansion and upgrading mode and is now processing pulses too.

Basically, a turmeric grinding machine is made up of heavy mild steel body. It comprises of impact pulverise machine with cyclone tank dust collector's stand, rail of motor, pulley of motor. Grinding is used to finish work piece that must show high surface quality and high accuracy of shape and dimension. Turmeric powder sieving is made up of heavy mild steel body with centrifugal sieve reel chhalna machine chain gear system double rotor counter shaft (without motor, electricals, v-belts) Turmeric polishing machine consists of descaling unit with capacity of 10 quintal/ per hour and inclusive of accessories. The automatic packaging machine packs turmeric pouches with the capacity of 200 gm., 500 gm., and 1,000 gm. The cleaning and grading machine for pulses is comprised of an electric motor driven machine with sieves which segregate dirt and refuse matter from the pulses in the first step and grade it into two or three categories as per operations.

The CFC of FAPRO will facilitate various activities such as bulk purchase of inputs and delivery to farmer members; marketing of produce, grading and quality control and first/second level processing. The common facility will not only supplement but also complement activities of farmers in the catchment area of the FPO as there is no similar facility available in the district for use by them. The initiative to establish a CFC will contribute towards crop diversification into commodities like turmeric and also pulses. It will also contribute towards increasing the livelihood incomes of about 354 member farmers. Nevertheless it will also enable

the farmers to move up the value chain into primary and secondary processing activity contributing towards regional growth. The project will contribute towards regional agri-business based industrial development. It will reduce rural urban migration trends and contribute to balanced growth. It will serve as a model option to reduce the debt burden on farmers in a state where simple average debt burden is in the range of Rs. 8 lakh per farmer. The envisaged project has a cost of Rs. 33.27 lakh, which is proposed to be financed through the contribution of FPO (Rs.3.33. lakh), bank term loan (Rs. 6.65 lakh), grant-in aid from GoI (Rs. 16.63 lakh) and grant-in aid from GoP (Rs. 6.65 lakh).

There is an expected turnover rise of FAPRO from CFC activities to Rs. 3.90 crore in the medium term. The CFC could help cluster farmers even double their income. More importantly, the envisaged common facility will help existing farmers move up the value-chain; help expand product and market mix and contribute towards crop diversification agenda of the State Government. While over 354 members are already directly or indirectly contributing to the project and will be beneficiaries, the proposed facility will also open for use by non-members and therefore hundreds of small and marginal farmers are expected to be benefited.

As part of the capacity building intervention, the ABPF has provided training inputs to the BoDs of FAPRO with the objective of enhancing their entrepreneurial skills and business acumen, complex issues regarding input saving, business planning and marketing. The ABPF has also provided the society with handholding support for preparation of a bankable business plan for proposed pulses and turmeric processing facility. The FPO has already been linked to various market players like Punjab Small Industries & Export Corporation (PSIEC) and distributors.

Samrala farmer producer company, Samlara

Potato is a starchy, edible tuber that is cultivated throughout the world and is consumed as a staple food. Its production is figured at 322 million metric tonnes. China leads the production table with approximately 23 per cent of the share followed by the Russian federation and India. The crop is not restricted to cooler climates only. It is also grown in the sub-tropical areas of the world like India and China as a winter crop. Punjab has major focus on the production of potato and is counted as one of the important potato producers especially for processing purposes. The peak crop availability is during December-February. The leading exporting country, which emerges from the import-export pattern of potatoes, is the Netherlands followed by Germany, Egypt, USA, Turkey, Poland, etc. The top five potato producing districts in

Punjab are Jalandhar with 5,28,404 MT, Hoshiarpur with 3,10,306 MT, Ludhiana with 2,56,440 MT, Kapurthala with 2,35,713 MT, Amritsar with 1,73,063 MT. China is the leading producer of onion constituting about 27 per cent of the world's total production. India is the second largest producer in the world.

The vast production base of vegetables offers India tremendous export opportunities. During 2013-14, India exported vegetables worth Rs. 5,462.93 crore. Onions, okra, bitter gourd, green chillies, mushrooms and potatoes contribute largely to the vegetable export basket (Ramya et al. 2015). The major destinations for Indian vegetables are UAE, Bangladesh, Malaysia, the UK, the Netherlands, Pakistan, Saudi Arabia, Sri Lanka and Nepal.

The vegetable processing industry in India is highly decentralised. A large number of units are in the small scale sector, having small capacities up to 250 tonnes/annum and co-existing with big Indian and multi-national companies, have capacities in the range of 30 tonnes per hour. The prominent processed items are pickles, chutneys and dehydrated vegetables. More recently, products like frozen dried vegetables and vegetable curries in restorable pouches, canned mushroom and mushroom products have been taken up for manufacture (Thakur & Padmadeo 2008).

West Bengal, Uttar Pradesh, Bihar, Madhya Pradesh & Gujrat are the five highest vegetable producing states. Punjab stands sixth in position in vegetables production. India is the second largest producer of vegetables in the world with an annual production of around 1,694.78 lakh metric tonnes and accounting for about 10-14 per cent of global production. China is the largest producer of major vegetables, contributing 29 per cent of total production. Russia, USA and Ukraine stands third, fourth and fifth respectively.

The total vegetable production of Punjab in 2013-14 was 40,11,028 metric tonnes in an area of 2, 03,734 hectares. Hoshiarpur, Jalandhar, Ludhiana, Amritsar, Bathinda, Patiala are the major districts in terms of area under production of vegetables. The important vegetables are potato, peas, cabbage, tomato, onion and cauliflower.

In this circumstance, the FPO plans to establish a CFC for vegetables processing and a cleaning, grading and sorting line. This FPO, the Samrala Farmers Vegetable Producer Company Limited is located in the village Samrala of Ludhiana district, Punjab. The FPO is a venture set up through collective efforts of more than 602 farmers and agriculture technocrats with the objective of self-marketing, and processing the farm produce.

Processing can transform vegetables from perishable produce into stable foods with long shelf lives and thereby aid in the global transportation and distribution of many varieties of vegetables. The goal of processing is to deter microbial spoilage and natural physiological deterioration of the plant cells. Generally, the techniques include blanching, dehydrating, canning, freezing, fermenting and pickling, and irradiating. The processing of vegetables begins with the sorting and grading of the vegetables. It is then followed by washing of the sorted vegetables. After vegetables have been washed clean, they must undergo blanching (heating) in hot water at 88°C (190°F) for two to five minutes or with steam in a conveyor (Jen 2011) at 100°C (212°F) for one-half to one minute. Then it is either sun dried or the moisture is swiped off in order to prepare it for packaging. The removal of water from vegetables is accomplished primarily by applying heat, whether it be through the radiant energy of the sun or through air heated by electrical energy. A major advantage of removing water is a reduction in volume and weight, which aids in storage and transportation of the dried products.

Upon implementation of the envisaged CFC, there is an expected turnover rise to Rs. 381.467 lakh in the medium term. The FPO could therefore help cluster farmers even double their livelihood incomes. Importantly, the envisaged common facility will help the existing farmers move up the value chain; help expand product and market mix. The proposed CFC is also expected to facilitate the bulk purchase of inputs and delivery to farmer members; marketing of produce, grading and quality control and first/second level processing. It would let the farmers realise higher price for their produce through aggregation and sale. The farmers from the FPO would be able to optimise processing costs through rationalised use of inputs.

Kandi area fruits and herbal processing society (KAFRO), Muktsar

India and Punjab are blessed with a range of horticultural produce. Amla or the Indian gooseberry is a fruit indigenous to the Indian sub-continent. To elaborate on the potential of amla, its extract is available in powder and pulp forms. The extract is primarily used to manufacture cosmetic products and ayurvedic medicines for cognitive effects, as anti-oxidants, in ulcer and diabetes prevention and offers anti-inflammatory benefits as well. In addition, it is also used in the manufacture of various beauty products and health foods. Amla is particularly effective in hair care: preventing hair loss and enhancing texture. Top amla producing countries are Germany, Russia and Poland. The top five amla producing states in India are Uttar Pradesh, Madhya Pradesh, Tamil Nadu, Gujarat and Andhra Pradesh. Punjab ranked

twelfth with 5,890 tonnes in the year 2014-15. The top five amla producing districts of Punjab are Hoshiarpur, Ropar, S.A.S. Nagar, Ludhiana and Shri Muktsar Shaib.

Mango is a juicy stone fruit (drupe) belonging to the genus Mangifera, consisting of numerous tropical fruiting trees, cultivated mostly for edible fruit. *Mangifera indica*—the "common mango" or "Indian mango" is the only mango tree commonly cultivated in many tropical and sub-tropical regions. It is the national fruit of India, Pakistan and the Philippines, and the national tree of Bangladesh. The leading mango producing countries are India, China, Thailand, Indonesia, Pakistan, Mexico, Brazil, Bangladesh, Nigeria and the Philippines. The top five mango producing states of India are Uttar Pradesh, Andhra Pradesh, Karnataka, Telangana and Bihar, Punjab ranking sixteenth. The top five mango producing districts of Punjab are Hoshiarpur, Ropar, S.A.S. Nagar, Patiala and Ludhiana with production of 23,853 MT, 13,585 MT, 11,115 MT, 6,121 MT and 4,885 MT respectively (2014-15).

Garlic is a crop that is well suited to a small acreage or as part of a larger direct marketing operation looking to diversify its mix of crops. The top garlic producing countries are China, India, Republic of Korea, Egypt, Russian Federation, Bangladesh and Ethiopia. The top five garlic producing states of India are Madhya Pradesh, Gujarat, Rajasthan, Uttar Pradesh and Assam. Punjab ranks sixth with 2,70,000 tonnes. The top five garlic producing districts of Punjab are Moga, Ludhiana, Ferozepur, Jalandhar and Patiala.

Bitter gourd or bitter melon or karela (*Momordica charantia*) is also a popular vegetable for its medicinal properties. Lemon is a citrus fruit. The five lemon producing states in India are Andhra Pradesh, Telangana, Gujarat, Karnataka and Odisha, Punjab ranking twentieth with 5,190 MT (2015). Carrot is a root vegetable - usually orange, white or red, white blend in colour with a crisp texture when fresh. Punjab ranks third in India in the production of carrot with 1,30,660 MT (2014-15).

Aloe vera belongs to the family Liliacae and is mainly cultivated for its thick fleshy leaves. Chilli is one of the most important and the largest produced spice in India, who is a leader in chilli production as well as exports. Chilli is also referred to as hot pepper, red pepper, cayenne pepper, capsicum, etc. Most of the cultivated varieties in India belong to the species *Capsicum annum.*

The ginger family is of a tropical group, especially abundant in Indo-Malaysian region, consisting of more than 1,200 plant species in 53 genera. The area under its cultivation in India is 107.54 thousand ha and the total production of the country is

385.33 thousand tonnes. The top countries producing ginger are China, India, Nepal, Thailand, Nigeria, Indonesia, Bangladesh, the Philippines, Republic of Korea and Sri Lanka. India ranks second in the production of ginger with 3, 85,330 MT. The top five states producing ginger in India are Assam, Gujarat, Meghalaya, Arunachal Pradesh and Sikkim.

Pickles may be cucumbers preserved in a solution of vinegar, salt, and other flavourings. They are typically fermented with naturally-occurring bacteria prior to vinegar preservation. Pickling technology has been known since ancient times, and pickles are still a popular food with over 5 million lb (2.27 million kg) consumed daily. Pickling of plant and animal foods is a relatively old method of food preservation. Different pickle manufacturers normally add spices to give their pickles a unique flavour. Dill-flavoured pickles are perhaps the most common of all pickles. There are also sweet pickles, which are packed with added sugar. There are six basic types of ingredients used in pickle making. The additional ingredients include acids, flavourings, colourants, preservatives, and stabilisers that make up the liquid or liquor in which the pickle is sold. Many of the ingredients are only available at certain times of the year, so steps have to be taken to use fresh materials. After the pickles have adequately fermented, the salt solution is drained. The pickles are then immersed in water to remove all of the salt they may have acquired during the cure. From this point, the pickles are moved along a conveyor to a slicing machine which cuts the pickles to the correct size depending on the type of product desired. They can be cut into slices, chips, or can even be diced. Attempts are made to maintain as clean an environment as possible for the pickles as contamination by microbes could result in an undesirable product. After being cut, the pickles are typically placed in glass jars although cans, plastic bottles and pouches are also used. The packing machines are designed to deliver the correct amount of vegetable to each jar. The jars are moved along to a liquid filling machine, which fills them with the liquor. From the filling machine, the jars are capped and moved along for pasteurisation.

The major fruits grown in India are banana, mango, citrus, guava, grape, apple and pineapple which constitute nearly 80 per cent of the total fruit production in the country. Banana has the largest share of 31.7 per cent in total fruit production, followed by mango with 28 per cent. The major fruit producing states in India are Andhra Pradesh, Maharashtra, Karnataka, Bihar, Uttar Pradesh, Tamil Nadu, Kerala and Gujarat, accounting for 70 per cent of the area under fruit cultivation and 78 per cent of total fruit production. The yield levels of most of the fruits are, however, relatively low as compared to those in other major fruit producing countries. There

exists considerable scope for improving the yield and production levels of almost all fruits.

Although India is a very large producer of fruits, per capita production is only about 100 gm per person per day. Further, about 25 to 30 per cent of the total production is lost due to spoilage at various post-harvest stages. In value terms, the post-harvest wastage and losses per year are estimated at over Rs. 3,000 crore. Because of these losses, the per capita availability of fruits is only of the order of 75 gm per person per day, which is just half of the requirement of a balanced diet.

India's share in world exports of fruits and vegetables is less than 1.5 per cent. Over 90 per cent of India's exports in fresh fruits and vegetables mainly go to western Asia and eastern European markets. With respect to export value, mango is the main fruit crop, and among vegetables onion occupies the first position. In recent years, potatoes and green vegetables like okra, bitter gourd, and green chillies have also been showing good export potential. Commodity-wise analysis reveals that majority of India's fruits and vegetables are exported to neighbouring countries, followed by the Middle East.

Pickles and chutneys may use fruits and vegetables or both, and are the traditional speciality product of India, which have gained an important position in Indian cuisine. There are many types of pickles available in India like chilly pickles, green pickles, lemon chutney, and mango chutney, gherkins, mango pickles, onion prepared/preserved, tomato chutney and so on.

India is also importing other processed fruits and vegetables, major exporter to India being China which has exported 13,667 MT in the year 2015-16. Similarly, China is again the top country which is exporting dried and preserved vegetables to India.

The fruit and herbal processing plant envisaged by the FPO, Kandi Area Food and Herbal Processing Society, is located in village Ramgarh Sikri in the Mukerian Tehsil of Hoshiarpur district, Punjab. KAFRO is a venture set up through collective efforts of more than 29 women farmers and agriculture technocrats, with the objective of self-marketing and processing the farm produce. The society has set up horticulture processing plants of vegetables and fruits.

KAFRO is already in operations. The existing infrastructure of the society consists of boiler, pulper, crusher, pickle cutting machine, juice machine, dryer and grinder, and packing machine. KAFRO wants to expand by installing new machines. The new machines to be installed are garlic peeling machine, pickle mixer and pickle filler. The

garlic peeling machine helps increase production levels of garlic pickle and paste to a very large extent. The machine will be able to process 1 quintal of garlic per day. This product is suitable for mixing the pickle. Pickle mixer has 'U' shape with heavy rotation blades. The machine is manufactured with stainless steel MS frame for smooth and vibration-free operation. The machine to be installed will have the capacity of 2 quintals per hour. Automatic pickle filling machines are high precision fillers meant to dispense pickles into bottles or pouches.

The envisaged CFC initiative is therefore an upgrading and expansion initiative. The CFC project envisages a project cost of Rs. 12.25 lakh, which is proposed to be met as follows: contribution of FPO (Rs.1.22. lakh), bank TL (Rs. 2.45 lakh), grant-in aid from GoI (Rs. 6.12 lakh) and grant-in aid from GoP (Rs. 2.45 lakh). Support for the project is requested as it is critically dependent on viability gap funding from the central and state governments particularly in view of weak nature of the promoters.

There is an expected turnover rise to Rs. 1.19 crore in the medium term. The CFC could help cluster farmers increase profit margins and value accruals considerably. More importantly, the envisaged common facility will help the existing farmers move up the value chain; help expand product and market mix. While members are already directly or indirectly contributing to the project and will be beneficiaries, the facility will also be open for use by non-members and therefore hundreds of small and marginal farmers will be benefited.

The CFC will facilitate the bulk purchase of inputs and delivery to farmer members; marketing of produce, grading and quality control and first/second level processing. It would let the farmers realise higher price for their produce through aggregation and sales. The farmers from the FPO would be able to optimise processing costs through rationalised use of inputs. The expected turnover rise from CFC activities is Rs. 2.25 crore in the tenth year. The CFC could help cluster farmers even double the income levels and value accruals.

Sum up

The benefits of a growing Indian economy and globalised value chains are yet to trickle down to the masses in the rural areas in India. One major cause is that 85 per cent of farmers in such areas are small and marginal with land holding being 1.33 hectares per farmer household. Due to this fragmentation, farmers do not have the wherewithal to upgrade their farm and post-farm management practices. Therefore, they need to be integrated into FPOs. Basically, the objectives of the producer

companies evolved are to: undertake various activities such as bulk purchase of inputs and delivery to farmer members; marketing of produce, grading and quality control and even secondary processing; procurement and maintenance of farm equipment for shared use. The case illustrations considered in this paper present interventions made on FPOs on a wide canvass. The benefits being accrued to member farmers range from considerable cost savings in sourcing inputs like seeds and fertilisers as well as larger net value accruals through marketing directly to end-consumers or national or global retailers. In essence, the paper validates the intervention approach of focus on FPOs as a means to level various scale economies to small and marginal farmer stakeholders. It also reflects and endorses the option of financing the capacity building and establishment of common facilities by such networks that agglomerate the produce by means of matching grants on PPP mode. Further, it validates the need for a Business Development Service providing platform, namely an Agri Business Promotion Facility to provide a range of services including: the evolution of producer (Padmanand et al. 2016) networks; facilitating management and technical training of such networks; providing guidance on the preparation of bankable business plans; linking networks with technology and equipment and credit related service providers; channelling links with apt markets and marketers; and providing a range of other capacity building and networking services to consortia of farmers or FPOs so as to enable them to move up the value chain, eliminate rent seeking middle-men even while adding value to the produce. Such interventions alone will enable the relatively deprived sections of India to integrate with the mainstream.

The stages of FPO development are several and the role of an ABPF is the most important. The stages include cluster and FPO identification and/or formation, conduct of diagnostic study and feasibility analysis. Business planning is carried out by the ABPF with the help of selected farmers' representatives. Business operations is the commencement of procurement, production, processing, marketing and other service activities of the FPO. ABPF trains both the governing and operational structures of the FPO. The ABPF will ensure that FPO will offer a variety of services to its members. This may cover almost all aspects of cultivation and primary/secondary processing (from inputs, technical services to processing and marketing). The FPOs will facilitate linkages between farmers, processors, traders, and retailers to coordinate supply and demand and to access key business development services such as market information, input supplies, and transport services.

Many countries across the globe have been promoting FPOs for decades. In Europe, development agencies and the state have initiated a joint stock company

model involving non-producers also to tackle the problem of resources for scale up and market connectivity. Denmark has a large number of organisations known as Dairy Companies which work on cooperative basis. They are given concessions under tax laws and the Companies Act. They collect most of total milk delivered in Denmark. New Zealand Dairy Co-operative Companies (CCs) are well organised and manufacture the entire range of dairy products and have 100 per cent share in the milk products market. The government exempts profits distributed to suppliers or transferred to reserves from taxation. CCs are a non-profit mutual organisation and therefore tax incidence is only at the level of individual producers. In Sri Lanka, farmer companies are investor-owned companies established under the Companies Act as "people's companies" registered with the Registrar of Companies and follow rules and regulations of a private company.

Under the ABPF initiative in Punjab, selected farmer producer companies of Punjab were supported and guided regarding the legal compliances like preparation of balance sheet and profit and loss account of the respective financial years followed by the auditing of accounts leading to the preparation of Audit Report. The ABPF also supported the FPOs in completing the required documentation for VAT registration, FSSAI licence registration, PAN application and inputs license. The ABPF helped the FPOs in preparing the exhaustive minutes of the Board of Directors meetings and annual/monthly general meetings. The FPOs also got the net worth certificates of their BODs prepared under the guidance of ABPF as it would help the financing agency to understand their financial status in order to support the project investments and working capital margin.

Market access is a major constraint for these FPOs. ABPF has played a major role in linking these FPOs with the market players such as Walmart, Reliance Fresh and local co-operating housing societies. Sangrur Vegetable Growers Producer Company had a direct selling experience in one such society where they were able to sell considerable quantity of vegetables and fruits. Based upon their successful endeavour, Sangrur Vegetables Growers Producer Company entered into MoU with Astra Agro Foods Pvt. Ltd. to supply their fresh fruits and vegetables to the buyers. The vendor application of Samrala Farmers Vegetables Producer Company, Sangrur Vegetables Growers Producer Company and Farmers Help Society have been submitted and accepted by Reliance Fresh. Cermica Foods, Pagro have shown interest in implementation of tomato programme, on contract farming from FPOs in Punjab. Interventions were also facilitated in terms of MoU with distributors of at least 50 hyper stores in Mohali, Chandigarh and Zirakpur with respect to the

procurement of turmeric, honey, murabbas and pickles from those FPOs who are into production of processed food, viz. FAPRO, Badal Honey cooperative and KAFRO. Punjab Emporium which is operated by the Punjab Small Industries & Export Corporation (PSIEC) has been approached by the ABPF. They have requirement for turmeric, honey, murabbas and pickles.

The FPOs such as FAPRO and KAFRO which are into direct sales of processed food products have working capital need in order to meet their day-to-day raw material procurement. Their proposals for cash credit facility are under preparation. The ABPF is already in touch with the financing agencies such as Ananya Microfinance (subsidiary of FWWB, Ahmedabad) in order to help them meet their working capital requirements.

The ABPF has also supported two FPOs viz. Sangrur Vegetable Grower Producer Co. Ltd. and Samrala Farmers Vegetable Producer Company Ltd. in preparing their documents and filling application for securing licence from Syngenta.

The ABPF has also undertaken the capacity building and training of FPOs with an objective to enhance their entrepreneurial skills and business acumen. The members and BoDs of all the six FPOs have been provided training in three separate day-long sessions on topics like orientation on management and business planning, input facilitation and technology updates. Representatives of various input players, buyers and technology suppliers like Syngenta, UPL, Ecofrost, Agrosaw, and CIPHET-Ludhiana participated and disseminated information on their respective area of expertise. These sessions have been of considerable help to the FPOs as they enhanced the business insight of the BoDs regarding the economic and technical viability of their proposed/ current business propositions.

The FPOs have been provided end-to-end handholding support in preparing detailed project reports for their respective business activities. They have been provided incubation services; for instance, the business plan of Farmers Produce Promotion Society, Hoshiarpur (FAPRO) has been prepared for the turmeric processing and pulses cleaning and grading. The Farmers Help Society, Dhira Pattra, Ferozepur has its business plan prepared for milk processing facility. The business plan of Badal Honey Bee Cooperative Society Ltd., Badal envisages an export quality honey processing facility. A vegetable cleaning and grading facility is envisaged by the Samrala Farmers Vegetables Producer Company Ltd., Samrala, Ludhiana district. A vegetable processing facility has been proposed by the Kandi Area Fruit and Herbal Processing FPO at Ramgarh, Hoshiarpur.

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