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REVIEW

Opportunities of Doubling Indian Farmers Income by Post Harvest Value Addition to Agricultural Produce

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ABSTRACT

The governments across the developing countries are facing a challenge of steadily increasing population, maintaining balance in demand and supply of food and upliftment in socio-economic status of farming community. Among the leading developing countries, India has successfully increased agricultural crop production by fourfold, thus having at most potential for adoption of secondary agriculture practices after harvest of farm produce. Post-harvest processing of agricultural produce like milling of cereals and pulses, extraction of oil from oilseed crops, development of value added ready to eat and ready to serve food product etc. not only facilitate efficient utilization of crop produce but also check losses fetching better returns to the farmers/entrepreneurs. Post-harvest processing operations at the production catchment area helps in minimizing post harvest losses, helps in generating employment opportunities in rural areas, purity assured products in turn open window for the developed products to qualify for wider market.

1. Introduction

The total population of India is expected to reach up to 1.55 billion by 2031 to become most populous country of the world [1]. Since Green Revolution, India's agricultural production hasincreased fourfold, at the same time India's demand for agriculture has continued to rise. India is leading producer as well as exporter of many fresh fruits and vegetables, spices, milk and second largest producer of wheat and rice. However, food security has been threatening problem for millions of people, with children, becoming the future youth have been severely affected.According to FAO, almost one-third of all food produced was lost and the amount is estimated to 1.3 billion tonnes per year [2]. These wastages and losses occur at each stage of food supply chain (FSC) from production to end consumers and at each stage of transition from freshly harvested to the storage, postharvest processing, retail and consumption. Eradication this chronic and pervasive problem and to meet sustainable development requires prompt action to process; value addition and preserve agriculture produce till it reach to the consumers table [3].

Agriculture has been considered the hallmark of the first stage of development, while the degree of mechanization has been taken to be the most relevant indicator of the country's progress along the development path. The mechanization of agriculture and development of agro- processing industries is thus a joint process which is generating an entirely new type of industrial sector. The vibrant agriculture sector offers various opportunities

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for the successful establishment of potentially profitable agro- processing units [4]. The potential for agro-industrial development in the developing countries is largely linked to the relative abundance of agricultural raw materials and low-cost labour in most of them. The most suitable industries in such conditions make relatively intensive use of these abundant raw materials and unskilled labour and relatively less intensive use of presumably scarce capital and skilled labour.

The problem of rural unemployment and low income has its own dynamic, since there is no money available for investing in highly input responsive agriculture. Hence there is a vicious circle of low input- low productivity – low income which needs to be changed to virtuous circle of judicious input- high productivity –high income, in order to sustain our agriculture. Many models to deal with serious situation are working with varying degree of success. One of the ways to create avenues for income and employment generation is to promote rural entrepreneurship based on agro-processing and value addition [5].

2. National Development through Post Harvest Processing

Food processing sector has tremendous potential to turnaround the whole economy right from farmer's field to national level as it directly targets farming sector by its characteristic ability of multiple product development from a single crop. This will increase demand for farming, farmers and hence impressive prices to produce.

Processing of raw food into primary, secondary and tertiary products reduce the contamination and spoilage by micro-organisms, fungus and disease and make it safe for human consumption as well as reduce storage losses and make it available for consumer's enjoyment round the year. Apart from this, left over part of crop such as risk husk can also be processed to get some useful product for e.g. rice bran oil; cattle feed; sugarcane bagasse can be used level power cogeneration at community level electrification to make villages self-reliant. Another advantage of localized food industry cluster is that, processing of fresh harvested food commodities at farm and local area level and value addition helps to increase income and livelihood of the primary sector employed population [6].

Localized processing of perishable food commodities can reduce volume of food in transportation, increases the scope of food packaging techniques, reduces food damage and wastage and preserve quality attributes. In addition to that it also reduces the burden on food logistic and ultimately to overall transport infrastructure of nation, reduces congestion of rail and roadways and reduces the fuel energy and power involved in the transportation that directly and indirectly contributes to the national Gross Domestic Product (GDP).

India'sdemographic dividend is much talked about and generating employment to this workforce is major challenge in front of the policy maker before it turns to demographic disaster. Food processing sector plays significant role in seizing this opportunity to convert demographic dividend to national power due to its potential to generate the plenty of direct and indirect employment opportunities. Installation of crop based micro, small and medium food processing infrastructure at localized level also absorbs skilled as well as unskilled workforce in rural areas and will have multiple impacts on socio-economic and political problems. Planed proliferation of food processing industries in countryside also reduce the economic exploitation of farmers by middleman, checks rural-urban migration that created slum/hygiene/health/social and infrastructural problem in mega cities and strengthen therural economy.Also contract processing based house hold cottage industries ensures income and security to poor women's, reduces their exploitation and increases there say and dignity in the family. Apart from all this, most of the post-harvest food processing industries are least environment pollutant unlike heavy industries that maintains the healthy rural livelihood. In short, it helps to bridge the gap between rural and urban to fulfill the Mahatma Gandhi's dream of making Indian villages self-sufficient.

3. Governments Participation and Enforcement

Due to the wider nature and robust potential of post-harvest food processing sector, government has never been lacking in grasping this opportunity and taken every possible action for the encouragement of this sector. A nodal Ministry of Food Processing Industries formulating and implementingpolicies and plans for creation of world class infrastructure, promotion of R&D in food processing, human resource development, setting analytical and testing laboratories and active participation in food standardization. To make strong consultative relationship between industries, R&D laboratories and academia two national level institutes of international standards such as National Institute of Food Technology Entrepreneurship and Management (NIFTEM) and Indian Institute of Food Processing Technology (IICPT) were established as "One Step Solution Provider" for any problem associated with this sector. Recent launch of *Pradhan Mantri Krishi Sampada Yojana* is single window umbrella scheme for establishment of Mega Food Park, development of integrated cold chain and value addition

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infrastructure etc targeted to supplement agriculture, modernise food processing and decrease agro-waste [7]. National Bank for Agriculture and Rural Development (NABARD) is also empowered with Special Fund for providing direct load for Mega Food Parks.

Scope of Indian food processing industry is not confined within territories of India but also opened its market overseas. Due to continuous intervention, encouragement, financial assistance, joint venture and other subsidies by Agricultural and Processed Food Products Export Development Authority (APEDA), India's food processing sector ranks fifth in the world in export, product and consumption. Food processing sector is 100% opened for FDI with single window application system to facilitate ease of doing business and attract foreign investors under Make in India initiative for generation of employment opportunities and inclusive development.

4. Augmenting Rural Prosperity through Food Processing

Government is successful in achieving 8.41% average annual growth rate between 2014-18 for food processing sector, above the overall agricultural growth [8]. However, most technologies developed by R&D institutes restricted in laboratories due to less extension activities. Development of small scale, farmer friendly, easy to handle, power efficient technologies and initiation of schemes such as "Scientist to Firms Door" can attract farmer's interest towards entrepreneurship and creation of stronger economic base. Rural farmers are unskilled labor of food processing sector, so skill development of farmers through hands on training and certificate courses in localized research stations, universities, KVKs is the key solution for their involvement for processing sector. Spatial crop based processing cluster development under the supervision and guidance of experts can helps to confidence building among farmers.

Creation of "Food Expert" portal under Digital India initiative for online supportentrepreneurs' problem can ensures time bound solution at free consultancy throughout the value chain. Development of custom hiring based food processing facilities can create scope to entrepreneurs for experimentation and market assessment before going for large scale production. "Contract Processing" on the basis of "Contract Farming" can reduce the farmers risk in the entrepreneurship, economic investment as well as storage and marketing strategies. Creation of "Minimum Support Price for Processed Foods" above the processing cost in line with the "MSP" can ensures market vulnerability of farmers and ensures fixed returns.

Cooperative business success as seen at AMUL and Lijjat Papad managed by cooperative named Shri Mahila Griha Udyog Lijjat Papad not only contribute for food processing sector but further extends to organize women for creation of Self Help Groups, to reduce poor-rich income gap, and helps to improve rural livelihood and self-sufficiency.

As said by Norman Borlaug "Without food man can live at most but few weeks, without it, all other component of social justice are meaningless", and this job of food production is solely done by farmers. So the mechanism should be developed where farmer can tract their produce during further value addition and 1% of the value added should be transferred in the farmers' account as an incentive under direct beneficiary transfer. Reorganisation of this *Rambaan* solution not ensures rural augmentation but also helps to achieve target to double the farmer's income as well as all the seventeen sustainable development goals.

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