

Prospect of secondary agriculture in enhancing farmers' income

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The secondary agriculture is considered as the sunrise sector of Indian economy. It comprises of manufacturing or processes that increase the value of primary agriculture. Some of the avenues of secondary agriculture are nurseries, bio-pesticides, bio-fertilizers, agro-processing, fruit and vegetable processing, micro, small and medium enterprises, bee keeping, agro-tourism, by-product utilization, waste utilization, etc. This sector has a great potential in providing employment opportunities to innumerable youth in the country. Value addition in these areas and their secondary products can provide two-four times higher incomes to the farmers. Therefore, goal of doubling farmers' income can be achieved by shifting into secondary agriculture. In India, there is a great scope of secondary agriculture due to immense quantity of production, adequate labour and facilities, shifting of people to value added and processed foods, assured market supply, consumer demand, etc. Thus, secondary agriculture implementation could be a boon to Indian economy, social status and environmental protection. This paper discusses about the aspects, importance and benefits of secondary agriculture, types and categorization of secondary agriculture enterprises and some of the developed secondary agriculture models.

Keywords: Agro-processing, Farmer First Programme, Secondary agriculture, Value addition

AGRICULTURE is the most significant sector in Indian Economy. This sector contributes nearly half of the national income and about 17% of the total GDP but the remuneration received by the farmers is not at that expected level. The average whole price at which commodity is sold by producer to trader determines the clear picture of farmer's condition. According to 3rd Advance estimates, DAC & FW (2020-21), the production of food grains (cereals and pulses) and oil seeds in India are 305.44 and 36.56 million tonnes, respectively. India ranks first in the world in production of milk, ghee, pulses, ginger, bananas, guavas, papayas, mangoes and second in production of rice, wheat and several other fruits and vegetables. Agriculture can be classified into three categories i.e. primary, secondary and tertiary. Primary

agriculture includes crop cultivation, growing and harvesting from natural resources and secondary agriculture comprises of manufacturing, or processes that add value to the raw material. Tertiary sector includes processes related to business perspectives. In India, only 8-10% of the total agriculture produce undergoes value addition. The highest value addition is seen in milk and lowest is in case of fruits and vegetables.

The low value addition is attributed to the non-availability of processable varieties of raw materials, seasonal nature of production, lack of awareness and knowledge, lack of adequate post-harvest infrastructure such as processing, cold chain, transportation and proper storage facilities.

Our country had achieved satisfactory progress in primary

agriculture but for doubling of farmers' income and increase in value addition of produce there is a need for shifting in field of secondary agriculture. The term "secondary" refers to next step activity or higher level of operations, thus secondary agriculture refers to elevated level of agricultural operations. It includes the procurement of locally available raw material and human resources therefore, it is defined as a productive activity at enterprise level that

- i. Utilizes the primary product and by-products of agriculture and other biological resources available locally in its rural agrarian neighbourhood;
- ii. Deploys locally available skills or a high level of rural manpower, to operate/manage/ maintain the production of goods and services;
- iii. Can be categorised appropriately under the micro, small or medium

enterprises.

Secondary agriculture is the concept of processing and adding value to basic agricultural commodities. It includes all food and non-food bio-resource based products for human and industrial use such as assembling, ripening, cleaning, grading, sorting, drying, preserving, packing and storing at local level. According to Annual survey of Industries (2017-18) the percentage share of registered and unregistered food processing sector to overall industry is 12.38 and 14.18%, respectively. Secondary agriculture helps in generating income and employment for farming households in village areas. In such type of system, inputs are manufactured in rural areas, thus resulting in movement of goods from rural to urban areas, while the money moves from urban to rural areas which is excellent for rural livelihood.

Some of the examples of secondary agriculture enterprises

1. Any farm related activity that uses the land or labour beyond the *kharif*, *rabi* seasons would qualify for a secondary agriculture activity.
2. Income generation activities that use the crop residues, viz. paddy straw fodder blocks, crop residue briquettes, crop pre-conditioning for markets (cleaning, sorting and grading of crop produce).
3. A jaggery production unit in the sugarcane growing area is the secondary agriculture, but it is processing unit when procures cane molasses from other regions.
4. A cottage scale unit using local raw materials and labours at village to create jam, jellies,

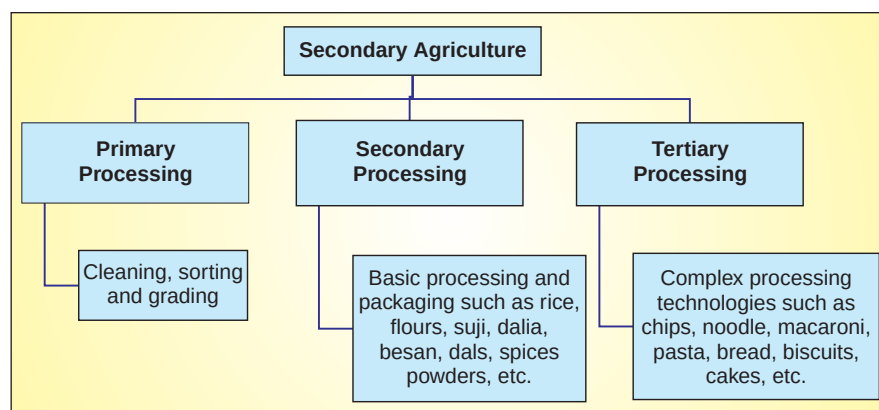


Fig. 1. Classification of secondary agriculture.

pickles, chips, khadi products, etc. is secondary agriculture but not if automated pulping and juicing factory that procures purees from other countries.

5. An agro-processing industry (Fig. 2) using local raw materials at farm level.
6. A milk pooling and chilling unit in a village would be secondary agriculture, but not a milk processing factory that sourced from thousands of such pooling units operated by a dairy cooperative.
7. Animal husbandry, dairy, poultry, sheep rearing that utilise the idle time of the family labour constitute secondary agriculture.
8. Small scale farm activities such as beekeeping, vermi-compost units, organic colour or dye making, mushroom spawning, back-yard poultry, silk worm breeding, nurseries, etc.

Classification of secondary agriculture: The secondary agriculture is categorized into three categories viz. primary, secondary and tertiary processing as shown in Fig.1.

Benefits of secondary agriculture

- It is the additional means of income and employment enhancement in rural areas.
- It acts as complement of various primary agricultural operations.
- It helps in efficient utilization of farm resources.
- It ensures better utilization of renewable agro-bioresources.
- Shifting of money from urban to rural areas.
- It helps in bringing idle resources into productive purposes.

Categorization of secondary agriculture

Broadly, the avenues of secondary agriculture can be categorised into three types:

- i. Value addition to primary agriculture production systems
- ii. Alternative enterprises
- iii. Enterprises that use crop residues and wastes of primary agriculture.

i. Value addition to Primary Agriculture Production Systems:

This category contains the activities related to inputs, production systems and harvest/post-harvest segments of the agriculture



Fig. 2. Agro-processing enterprises.

value chains. Simply, this category includes those enterprises that add value to the primary agriculture activity (Figs. 3, 4). Some of the avenues are given in Table 1.

ii. Alternative Enterprises:

These enterprises generate income without competing with the resources (land and manpower) used in primary agriculture (Figs. 5, 6, 7). Some of the avenues are given in Table 2.

iii. Enterprises that use crop residues and wastes of Primary Agriculture:

These enterprises include income generation activities that make use of residues and wastes of various field crops, horticultural crops, products of animal origin and forest produce (Figs. 8, 9). Some of the avenues are given in Table 3.

Secondary agriculture models developed under Farmer FIRST Programme

Some secondary agriculture models are also established by Farmer FIRST Programme, ICAR-CIPHET, Ludhiana. These models are honey processing unit (processing of extracted honey to pasteurized honey), chemical free jaggery production plant (processing of sugarcane into solid and granular jaggery) and agro-processing centre (processing of cereal grains, pulses, oil seeds and spices). These units are used by group of farmers by using

local raw materials and human resources.

Table 1. Avenues related to primary processing

Input	Harvest/Post-harvest
Nursery for horticultural crops, forest species, field crops, flowers	Pre-conditioning produce for markets: Fruits, vegetables, flowers, spices, etc. Assaying, packaging, pre-cooling and dispatch hubs.
Vermicompost	
Anaerobic digested compost	Micro and small enterprises that can process the primary agriculture produce: garlic extracts/paste, turmeric powder, pickles, jams, etc.
Bio-fertilisers production (Azospirillum, Azolla, etc.)	
Bio-pesticides (concoctions, bio/plant extracts, etc.)	Custom Hiring Centres
Water, Soil Testing/Analysis	Agro-tourism
Animal feed/fodder production (including urea enriched straw blocks)	Weaving, breeding, flavours, dyes, ayush medicines, etc.



Fig. 5. Bee farming.



Fig. 6. Sericulture.



Fig. 7. Hydroponics.



Fig. 3. Crop nursery enterprise.



Fig. 4. Cattle feed production enterprise.

SUCCESS STORIES

1. Mr. Jaswant Singh was doing farming and earning ₹ 2.25-2.5 lakh per annum. After getting training and guidance from ICAR-CIPHET, Ludhiana he established agro-processing center (Pabla Brothers, Bharta Khurd, Rahon, Punjab) in year 2017 with the support of Farmer FIRST Programme of ICAR for processing of cereals, pulses, spices, etc. He is procuring raw material from fellow farmers and supply products like wheat flour, maize flour, besan, turmeric powder, chilli powder, etc. from developed facility in nearby area. The income of farmer has been increased to about ₹ 3.5 lakhs (30-35%) and the associated farmers are also getting premium price over raw material.

2. Mr. Paramjit Singh Khalsa farmer from Balachour, SBS Nagar, Punjab was



Fig. 7. Biogas plant.



Fig. 8. Banana fibre products.

Table 2. Avenues of alternative enterprises

Bee keeping	Palmyra palm products	Bamboo products
Coir extraction and products	Broomstick production	Mahua products
Venom farming	Dhaincha farming	Integrated farming
Hydroponics	Kitchen gardening	Babui grass products
Corn powder production	Ram servicing	Lac cultivation
Rural Tourism/ Agri-Tourism	Bull servicing	Sericulture, Silk works

Table 3. Avenues of enterprises that use crop residue

Cotton stalk products	Fibre boards etc., from Rice straw	Agave / Banana fibre extraction & products
Dung logs, bio-gas, leather extracts, etc.	Urea enriched fodder block from Rice straws	Cutlery plates from Wheat husk, Arecanut leaves, Siali leaves, etc.

doing farming of cereals, pulses, turmeric and vegetables. He was selling his farm produce to middlemen and local mandis and earning around a annual profit of ₹ 3.5-4 lakhs. With the technical guidance and support from ICAR-CIPHET, Ludhiana, he established agro-processing center (Khalsa Farm) for processing of his produce. The various processed products are wheat flour, wheat dalia, maize flour, maize dalia, besan, traditional wadis, turmeric powder, chilli

powder, coriander powder, garam masala, black pepper powder, etc. This intervention helped in increasing the income of the farmer to ₹ 7-7.5 lakhs (40%).

SUMMARY

Secondary agriculture is basically entrepreneurship development method that helps in generating income and employment for farming household in village areas. To achieve the objective of sustainable development and doubling farmers' income, implementation of different

enterprises under secondary agriculture is most necessary. It is the complement of primary agriculture operations at farm level. Through secondary agriculture, money can flow from urban areas to rural areas, that helps in development of rural households. The broad categorization of secondary agriculture under enterprises is required to be managed effectively. These enterprises help in increasing the income of the farmers by 30-40%. As the demand of nutraceuticals and value-added products is increasing in the market, there is immense scope of secondary agriculture in the country. However, new policies and initiatives for encouraging value-addition of the agricultural produce in production catchment areas are required.

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