

Crop Diversification: A Way for Food and Nutritional Security

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Introduction

India is a country of about one billion people. More than 70 percent of India's population lives in rural areas where the main occupation is agriculture. Indian agriculture is characterized by small farm holdings. The average farm size is only 1.57 hectares. Around 93 percent of farmers have land holdings smaller than 4 ha and they cultivate nearly 55 percent of the arable land. On the other hand, only 1.6 % of the farmers have operational land holdings above 10 ha and they utilize 17.4 percent of the total cultivated land. Due to diverse agro-climatic conditions in the country, a large number of agricultural items are produced. Broadly, these can be classified into two groups food grains crops and commercial crops. Due to the challenge of feeding our vast population and the experience of food shortages in the pre-independence era, 'self-reliance' in food grains has been the cornerstone of our policies in the last 50 years. Around 66 percent of the total cultivated area is under food grain crops (cereals and pulses). Concurrently, commercial agriculture developed for whatever reasons in the pre-independent phase also kept flourishing during the post independent period. Commercial agriculture not only catered to the domestic market but has also been one of the major earners of foreign exchange for the country.

Crop Diversification

Crop diversifications means adopting the crop mix which is flexible and help a farmer in taking that decision which is based on the principle of profit maximization. Through it the farmer reallocates his productive resources from a traditional crop mix into a new crop mix due to any definite factors. It can be shift from:

1. Low value crop to high value crop.
2. Single crop to multiple crops.
3. Water loving crop to water saving crop.
4. Labour intensive crop to employment generating crop.
5. Low income generating crop to high income generating crop.
6. Low average income of major crop (per hectare) to high average income of minor crop (per hectare).
7. Primary good to value addition & processing.

Need of Crop Diversification

Literature has provided us several benefits of crop diversification ranging from short run to long run. The short run benefits are:

1. Improves food security.
2. Shifts consumption pattern.
3. Increases and ensures availability of sustainable income.
4. Risk mitigation.
5. Employment generation.
6. Poverty alleviation.
7. Improving productivity and efficiency in scarce resources use (e g : drip irrigation or vertical gardening)
8. Export promotion.
9. Conservation of natural resources particularly land and water help in switching farmers from illegal narcotic producing crop (like cocaine) to alternative crop production for their livelihood.

These short-run benefits of crop diversification ensure long-run benefits such as regional equity, growth prospects in agriculture and sustainable farming systems.

Factors Influencing Crop Diversification

One or many of the factors which act as an incentive for the farmers to diversify.

- 1. Resource/climate related:** Irrigation, rainfall & soil erosion.
- 2. Tech related:** Seeds, fertilizer, storage, processing.
- 3. Household related:** Food & fodder self-sufficiency + investment capacity.

4. Price related: Factor affecting price directly/ by industry.

5. Institutional & infrastructure related: Farm size, govt. regulation, credit access, and farm extension services, post-harvest and production facilitation, marketing and trade.

6. Social factors: Farmers age, education & experience, peer pressure.

The factors responsible for crop diversification can be divided into three broad categories viz.,

1. Economic factors consisting all economics and finance side factors.

2. Social factors consist of social factors which make a farmer to take decision towards diversification depending on the condition of risk aversion, income enhancement, and increase in productivity or subsistence.

3. Biological factors have all those factors which come into natural factors for crop production. A farmer can go towards crop diversification depending on the absence or availability of any factor mentioned above.

➤ Diversification is mostly adopted as the risk mitigating tool. It stabilizes the farm income through cultivation of high-value crop with a bonus of less investment requirement. It can be through:

1. Area augmentation.

2. Crop substitution.

Sources of Crop Diversification

1. Area augmentation: By increasing cropping intensity, utilizing fallow lands, rehabilitation of degraded lands and deforestation (an environment concern), CD can be attained through source of area augmentation.

2. Crop substitution: It refers to replacing one crop for another crop keeping in mind profit, demand, price and physical condition required for the crop.

Food Security

The World Food Summit in 1996 indicated that:

“When all people at all times have physical and economic access to sufficient, safe and nutritious food to meet the dietary needs and food preferences for an active and healthy life”.



Literature revealed that the term 'food security' currently has more than 200 definitions and 450 indicators of food security. It has multiple dimensions covering Quantitative (having enough quantity of food), Qualitative (reliance on inexpensive nutritious foods), Psychological (no anxiety/stress associated to meet daily food needs) and Social (acquiring food through socially acceptable means not as charitable assistance, buying food on credit, and stealing) dimensions. Irrespective of the dimension, Food security is one of the major issues in current global economic and social scenario. It is not the problem of a single economy rather it refers to global world.

Research and Developmental Support for Crop Diversification

Future agriculture will be much more knowledge and skill based rather than the traditional subsistence agriculture. In the wake of globalization and opening up of the global market, there will be much more opportunity for entrepreneurship development in agriculture. This also calls for paradigm shifts in research and technology development and also the transfer of technology for successful crop diversification. The research system not only needs to address the issues connected with continuance and indulgence and knowledge in the areas of emerging technologies but also create a cadre of scientists through the continuous upgrade of skills and human resource development. The researchers also need to popularize the technologies, impart knowledge and skills to the extension functionaries for the transfer of technologies to the farmers. This knowledge-based farming will call for much more interaction between the researchers, extension workers and farmers. The fruits of the innovative technologies should reach the farmers at the earliest and also spread in the quickest possible time.

Conclusion

Crop diversification is one of the best options to increase farm income, leading to food, nutrition and ecological security, as well as poverty alleviation in developing countries. In order to attain the desired level of crop diversification and accelerate technological advancement in agriculture, paradigm shift in cropping system is necessary. In the face of these new changes including the achievement of food self-sufficiency, the area shift that tended towards cereals in the immediate aftermath of the Green Revolution, has started moving in the opposite direction, i.e., from cereals to non-cereals.