

Crop diversification: an important way-out for doubling farmers' income

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In the past five decades or so, increasing agricultural production and ensuring food security was the main concern for agricultural development. To the great satisfaction, Indian farmers with the help of agricultural scientists and policy makers could achieve that by bringing 'Green Revolution' and 'Rainbow Revolution'. This not only brought smiles to the face of millions of Indians, but also established India as the self-sufficient country in agriculture and face-lifting of Indian agriculture in world map was made possible. These strategies involved an increase in productivity through intervention of better crop production technologies and varieties, among few others. It showed 45% increase in per person food production, which has made India not only food self-sufficient at aggregate level, but also a net food exporting country. Most importantly, during the last half century, India's food production multiplied 3.7-fold. However, the strategies could not recognize the need to raise the farmers' income and there was no direct relation to promote farmers' welfare.

Key words: Crop, Diversification, Farmer, Income

THE most important reason for the emergence of agrarian distress in the country during 1990s is the low level of absolute income as well as large and deteriorating disparity between income of a farmer and non-agricultural worker, which turned even more serious in latest years. In this background, the goal set to double farmers' income by 2022-23 can play crucial role to promote farmers welfare, reduce agrarian distress and bring parity between income of farmers and those working in non-agricultural professions. According to the reports published from *Niti Aayog*, doubling real income of farmers till 2022-23 over the base year of 2015-16, requires annual growth of 10.41% in farmers' income. Therefore, strong measures are actually needed to harness all possible sources of growth in farmers' income within as well as outside agriculture sector. As described by the central government, the major sources of growth

operating within agriculture sector may be improvement in productivity, resource use efficiency or saving in cost of production, increase in cropping intensity, diversification towards high value crops etc. In the due course, many useful strategies were proposed like Irrigation ('Per Drop More Crop'); Quality seeds (Improving seed replacement rate); Soil-test based nutrient management (Distribution of soil-health cards); Post-harvest crop losses (Large investments in warehousing and cold chains); Value addition; Creation of a national agricultural market, removing distortions and e-platform etc.; New crop insurance scheme (*Pradhan Mantri Fasal Bima Yojana*)-Minimum Premium and Maximum Security; and Promotion of ancillary activities (poultry, sericulture, beekeeping and fisheries) etc. Though the doubling farmers' income by 2022 looks quite challenging but it is needed and is attainable. Crudely, increase in area

and productivity can be two major options to increase the agricultural output.

Three prolonged strategies focused on (i) development initiatives, (ii) technology and (iii) policy reforms in agriculture are needed to double farmers' income. High demand of lands for non-agricultural sectors limits the possibility for further expansion of the land for cultivation. Besides, the productivity of the most of the crops is low in the country, and there is a huge scope to raise the productivity to enable doubling the farmers' income. Even within the country, there is huge yield variation of different crops among the states. Bridging yield gaps among the states is important in improving national productivity i.e. the gap between Punjab and Chhattisgarh in rice yields still exists almost 3 times. Variation in productivity with the same level of irrigation, and low income level of the farmers is due to the less adaptation of developed



technologies and lack of modernization of farms. Specific action plans may help in bridging the yield gaps, which in turn will contribute to enhance productivity of farming systems. Farmers, at least medium and big farmers associated with small-and marginal-farmers, may think of taking up the agriculture alternatively, say the diversification of crops and integrated farming system, which may turn more remunerative, better input use efficient, and less risk involved. Promotion of integrated farming system approach requires synergistic blending of crops, horticulture, dairy, fisheries, poultry, etc. Micro-irrigation along with the nutrient application can be highly efficient and priority should be given to empower farmers with micro-irrigation. Appropriate time has come to promote energy-efficient and gender-neutral farm equipment, machinery, and small engine-driven tractors to address both the drudgery issue and time component, adequately. Among the different strategies and technologies, crop diversification and inclusion of new varieties is of the prioritized technology to increase the farm income and profitability.

Crop diversification and inclusion of new varieties: Agricultural crop diversification is an important stress-relieving option for economic growth of the farming community. Diversification of agriculture in the first Green Revolution areas such as Punjab, Haryana and Western Uttar Pradesh seems need of the hour. Crop diversification refers to the addition of new crops or cropping systems to agricultural production on a particular farm taking into account the different returns from value-added crops with complementary marketing opportunities. Crop diversification and inclusion of the new varieties can be one of the important technologies in increasing the farmers' income to a certain extent, if not double. The aim of crop diversification is to increase crop portfolio so that farmers are not dependent on a single crop to generate their income. When farmers go for single crop type they are

exposed to high risks in the event of unforeseen climate events that could severely impact agricultural production, such as emergence of pests and the sudden onset of frost or drought.

Introducing a greater range of varieties in a particular agro-ecosystem leads to diversification of agricultural production which can also increase natural biodiversity, strengthening the ability of the agro-ecosystem to respond to these stresses. The introduction of new cultivated species and improved varieties of crop is a technology aimed at enhancing plant productivity, quality, health and nutritional value and/or building crop resilience to diseases, pest organisms and environmental stresses. It reduces the risk of total crop failure and also provides alternative means of generating income, as different crops will respond to climate scenarios in different ways. While the cold may affect one crop negatively, production in an alternative crop may increase. Crop diversification in India is generally viewed as a shifting from traditionally grown less remunerative crop(s) to more remunerative crop(s). Crop diversification and growing of large number of crops are practised in dryland areas to reduce the risk factor of crop failures due to recurring droughts. Crop substitution and crop shift are also taking place in the areas suffering with some specific soil related problems, like salinity, sodicity, acidity etc. Conclusively, major advantages of crop diversification include income increases of small farm holdings; less risk for price fluctuation, climatic variability etc.; balancing food demand; increasing the production of quality fodder for livestock animals; beneficial for conserving natural resources; minimize environmental pollution; reduce dependence on off-farm inputs; and community food security can be increased. Research institutes should come with some other technological breakthroughs for shifting production frontiers and raising efficiency in use of inputs, precision farming to raise production and income of farmers substantially etc. Farm mechanization with

modern machineries such as, precision seeder, laser land leveler and planter, and practices like SRI (system of rice intensification), direct seeded rice, zero tillage, raised bed plantation and ridge plantation, drip and sprinkler irrigations allow technically high efficient farming and sustainable income enhancement.

SUMMARY

Persistent low level of farmers' income can cause serious adverse effect on the future of agriculture in the country. To secure future of agriculture and to improve livelihood of half of India's population, adequate attention needs to be given to improve the welfare of farmers and raise agricultural income. Introduction, adaption and acceptance of new varieties as well as new and upcoming production technologies can potentially strengthen farmers' cropping systems by increasing yields, improving drought resilience, boosting resistance to pests and diseases and also by capturing new market opportunities. There is a need to identify crops and varieties that may suit to a range of environments and farmers' preferences. Crop diversification provides better conditions for food security and enables farmers to grow surplus products for sale at market and thus help to obtain increased income to meet other needs related to household well-being. Crop diversification can enable farmers to gain access to national and international markets with new products, food and medicinal plants. Diversifying from the monoculture of traditional staples can have important nutritional benefits for farmers in developing countries and can support a country for becoming more self-reliant in terms of food production. Diversification can also manage price risk, on the assumption that not all products will suffer low market prices at the same time and increase the profitability of the farming community.

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