

paddy and wheat growers use hybrids. These yield gaps can be increased by enhancing Total factor productivity.

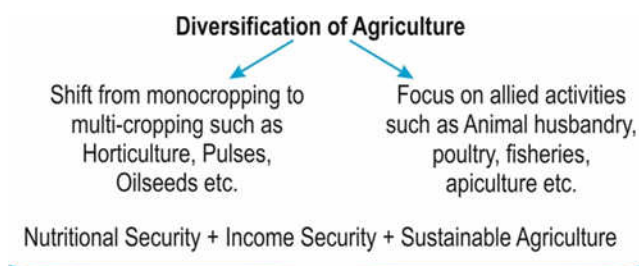
Concept of Total Factor Productivity: Total Factor Productivity (TFP) measures the efficiency with which inputs are utilised. An increase in TFP would mean that inputs are more efficiently utilised through innovations and improved management techniques. An increase in TFP is associated with higher efficiency in use of the available inputs, higher output and higher profits.

STEPS TO INCREASE TOTAL FACTOR PRODUCTIVITY

- Investment in R&D for the adoption of better technology
- Adoption of high yielding varieties of seeds
- Access to micro-Irrigation techniques
- Focus on extension activities to empower farmers through sharing information, technology, skills, farm management practices
- Balanced utilisation of fertilisers
- Thrust on Agricultural Mechanisation
- Organise farmers into Farmer Producer Organisations (FPOs) to take benefit of economies of scale.
- Improve post-harvesting infrastructure such as collection centres, warehouses, cold chain infrastructure etc.

► AGRICULTURAL DIVERSIFICATION- NEED FOR RAINBOW REVOLUTION

The phenomenal increase in production of Food grains after the Green Revolution has not translated into commensurate increase in food security. This is evident in India's poor ranking on global indicators such as Global Hunger Index (GHI). This can be attributed to lack of diversification in agriculture, which has also led to stagnation in income levels of farmers.



Nutritional security through Diversification: Presently, the production basket of agriculture is dominated by Rice and Wheat. However, there has been shift in consumption pattern towards more protein-based foods such as Pulses, Milk, Egg, Fish, Meat etc. leading to demand-supply mismatch and thus nutritional insecurity. The diversification towards cultivation of other crops and livestock rearing would address the micronutrient deficiencies, Vitamin, iron deficiencies etc.

Enhancing Income levels of Farmers through Diversification: According to Dalwai panel, expansion in diversification by 1 ha could increase annual income of farmers by Rs 1 lakh on account of following reasons:

- **Higher Productivity:** The cereal crops occupy 42% of agricultural land but contribute only 20% of agricultural GDP. However, horticultural crops occupy only 14% of agricultural land but contribute 33% of agricultural GDP.
- Agricultural production would be more aligned with demand and hence fetch higher prices.
- Increase in the cropping Intensity due to shorter crop duration in comparison to Rice and wheat
- Reduction in risks and ensure constant flow of income
- Optimum utilization of land

Thus, looking at these benefits, the Government has to now focus on **Rainbow revolution** in order to bring about holistic development of all sectors- horticulture, animal husbandry, poultry, fisheries, food grains etc. This would have multiple benefits- nutritional and food security, income security for farmers and overall make agriculture more inclusive and sustainable.

► NUTRI-CEREALS/ MILLETS

Millets such as Jowar, Bajra, ragi etc. are **dual purpose, nutrient dense, hardy and low input intensive crops** that have potential to address malnutrition and climate change, while promoting sustainable agriculture. In India, millets are grown on about **17 million ha** with annual production of **18 million tonnes and contribute 10 percent** to the country's food grain basket.

