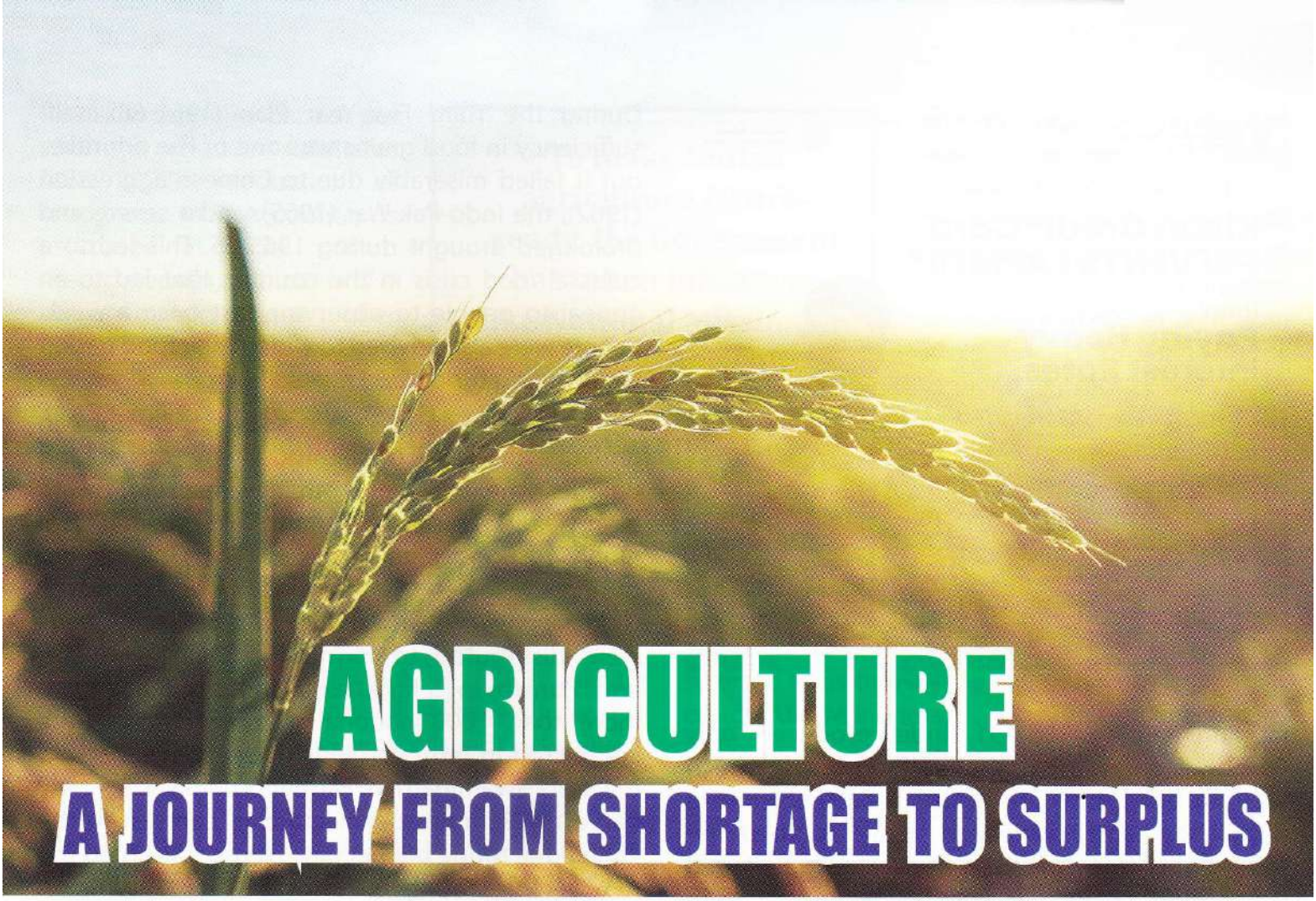

AGRICULTURE
A JOURNEY FROM SHORTAGE TO SURPLUS

Struggling with hunger and poverty, the nation drafted its first Five-Year plan (1951-56) for development, with the highest priority being to increase agricultural production and eliminate hunger. Consequently, agricultural production increased, prompting the Government to shift its focus from agriculture to industrial growth in the second Five-Year plan. Today, India stands tall in the global arena of agriculture with many meritorious positions. It is noteworthy that India's foodgrain production has outpaced its population growth. Rising from self-reliance, Indian agriculture is now moving forward to become a global powerhouse of agriculture.

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Over the last 75 years, Indian agriculture has scripted a remarkable and momentous success story of transformation. Beginning with an acute shortage of food commodities at the time of independence, we are now a proud food surplus nation with a rising trend of agri-exports. Looking back, India gained freedom under the shadow of the devastating Bengal famine (1943-44) in which nearly three million people perished due to malnutrition or disease. India's population was subject to an acute food shortage, frequent droughts, and famines, and suffered from pervasive malnutrition. Even though nearly 85 per cent of the population lived in villages and derived their livelihood from agriculture, the country was abysmally short of food grains, mainly due to the aversive policies of the British towards

farming. During 1950-51, India produced only 50.82 million metric tonnes of food grains, which was not enough to adequately feed the growing population and compelled India to beg for food grains from the USA and other developed economies. Successive wars in 1948, 1962, and 1965, together with recurrent droughts, further deteriorated the situation. This grim scenario pushed the country into an unprecedented 'ship-to-mouth' existence and also defamed India as a 'begging bowl' nation. The USA donated large quantities of wheat under the PL-480 Scheme to save millions of Indians from hunger. But soon, it diminished to a very low level due to strained international relations. During this period, a famous book, Famine 1975, by William and Paul Paddock predicted that millions of Indians would starve to death in the years to come.

Tales of Transformation

Struggling with hunger and poverty, the nation drafted its First Five-Year Plan (1951-56) for development, with the highest priority being to increase agricultural production and eliminate hunger. Nearly one-third of total plan funds were allocated to agriculture, which drove growth in irrigation facilities and fertiliser production in the country. Consequently, agricultural production increased, prompting the Government to shift its focus from agriculture to industrial growth in the Second Five-Year Plan (1956-61). Allocation to agriculture were also curtailed by 20 per cent. During the Third Five-Year Plan (1961-66), self-sufficiency in food grains was one of the priorities, but it failed miserably due to Chinese aggression (1962), the Indo-Pak War (1965), and a severe and prolonged drought during 1965-66. This led to a colossal food crisis in the country. that led to an appeal to people to observe a fast once a week. People were also advised to widen their food basket by including tubers and millets.

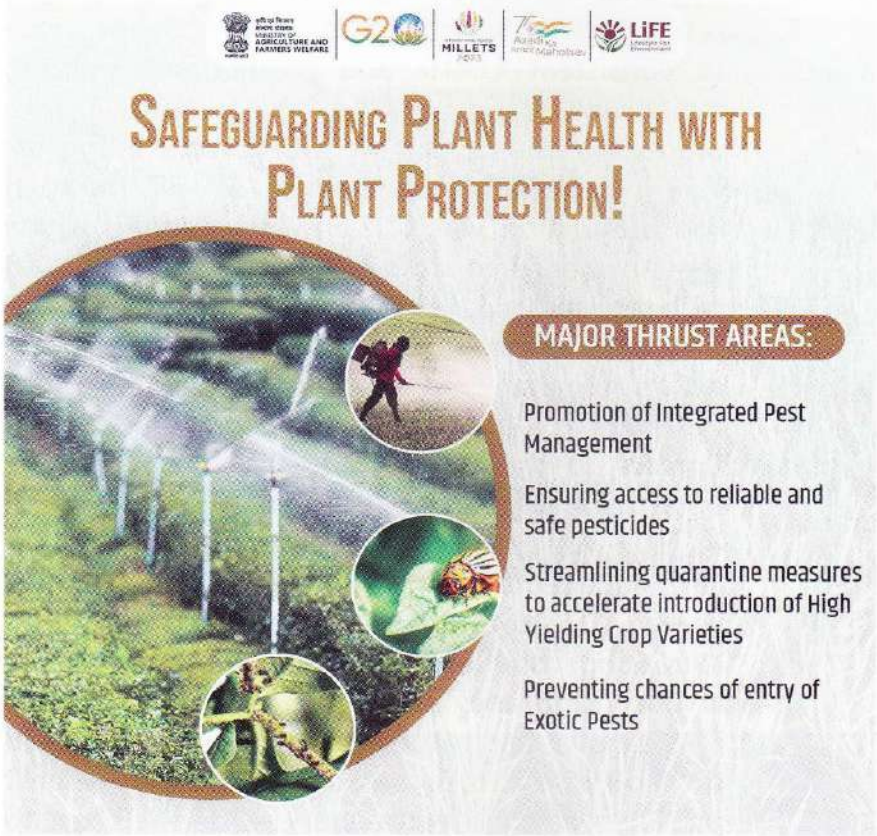
Meanwhile, in Mexico, a scientist, Dr Norman Borlaug, made a breakthrough by developing unique wheat varieties that were semi-dwarf, high-yielding, disease-resistant, fast-growing, and highly responsive to fertilisers. The Government of India allowed the import of 18,000 metric tonnes of new wheat varieties in 1966. These seeds were distributed to farmers in Delhi, Haryana, and Punjab in 5-kg packs; and simultaneously, more than 1000 national demonstrations were conducted in farmers' fields under the leadership of Dr MS Swaminathan. Farmers could successfully harvest 4-5 tonnes per hectare, in contrast to the earlier one tonne per hectare. Farmers adopted the new varieties wholeheartedly. In 1968, the nation reaped a bumper harvest of 17 million metric tonnes of wheat, up from 11 million tonnes in 1966. This was the largest leap in wheat production ever recorded in the world. This was termed as the 'Green Revolution'. This was followed in rice, and subsequently, production jumped in other crops like sugarcane, cotton, and fruits and vegetables. This laid the foundation for self-sufficiency and now we have moved further as a surplus foodgrain nation and a net agricultural exporter. To attain this unique distinction, scientific skill, political will, and farmers' toil all acted synergistically on a single platform.

India embarked upon a new era of farming driven by the application of science and technology in the fields. Simultaneously, the Government provided policy support, fund allocations, and subsidies to the agriculture sector through various specific schemes. As a result, today India stands tall in the global arena of agriculture with many meritorious positions. India is the world's largest sugar-producing country and holds the second position in the production of rice only after China. As the second-largest producer of wheat, India had a share of around 14.14 per cent in global wheat production in 2020. India is also the largest producer and consumer of pulses, with a rapid pace

towards self-reliance. As per second advance estimates (2022-2023), production of foodgrains in the country is estimated at 323.5 million metric tonnes, which is 7.9 million metric tonnes higher than 2021-22. As per the third advance estimate, a record 342.33 million metric tonnes of horticultural production are estimated in 2021-22, which is 7.73 million metric tonnes higher than the production of 2020-21. The total production of sugarcane during 2022-23 is estimated at a record 468.8 million metric tonnes, which is 155.3 million metric tonnes higher than the average sugarcane production. Being deficit crops, oilseeds were given a special thrust by launching the National Mission on Oilseeds and Oil Palm during the 12th Five-Year Plan period. A breakthrough was realised in oilseed production by introducing the latest crop production technologies and expanding its fields in new areas. Consequently, oilseed production grew to 400 lakh metric tonnes in 2022-23 from 108.30 lakh metric tonnes in 1985-86. From the years 2015-16 to 2020-21, the compound annual growth rate of production was 7.7 per cent. The special mustard programme, initiated during rabi 2020-21, brought the most spectacular result: mustard production registered an increase of 40 per cent from 91.24 to 128.18 lakh metric tonnes and productivity saw an 11 per cent increase from 1331 to 1447 kg per hectare. The area under rapeseed and mustard increased by 29 per cent, from 68.56 lakh hectares in 2019-20 to 88.58 lakh hectares in 2020-23. The quantum jump in oilseed production is often referred to as the 'Yellow Revolution' in the annals of agriculture in India.

To make Indian agriculture future-ready, the Government has taken initiatives like National Mission on Sustainable Agriculture, Agri-Tech Infrastructure Fund, Paramparagat Krishi Vikas Yojana, Rashtriya Krishi Vikas Yojana on a national platform.

It is noteworthy that India's foodgrain production has outpaced its population growth. From 1951 to 2022, foodgrain production recorded a compound growth rate of 2.61 per cent per annum, whereas the population growth rate remained at 1.95 per cent. While the production of cereals has surged by almost sevenfold, the production of pulses has increased by 3.25 times during the same period. The per capita per day availability of food grains has increased from 395 grams in 1951 to 514.5 grams in 2022. The production of horticultural crops (60% vegetables, 31% fresh fruits) has recently outpaced the production of food grains, thus making a strong contribution to the nutritional security of the country. Being a food surplus nation, the Government is promoting agri-exports in the interest of farmers and 'agripreneurs'. As a result, agri and allied exports have increased from 41.86 billion USD in 2020-21 to 50.24 billion USD in 2021-22, that is, an increase of nearly 20 per cent. While celebrating the International Year of Millets (2023), India is set to become an international hub for millets, which have been recently named '*Shree Ann*'. Its various promotional strategies have increased its production to 159 lakh metric tonnes in 2022-23, while the Government has set its target to produce 170 lakh metric tonnes in



2023-24. During the Covid-19 pandemic, Indian agriculture exhibited its best by producing record foodgrains, which enabled the country to supply food to pandemic-hit poor nations.

Spectrum of Revolutions

There are many parallels between the Green Revolution and the White Revolution, both of which have played seminal roles in bringing self-reliance to food grains and milk, respectively. Just like food grains, India was struggling with the availability of milk at the time of independence, with a mere production of 17 million metric tonnes. As our population grew, per capita milk availability declined, further pushing the nation into a milk crisis. The Government had set up dairy schemes in metro cities, but a large part of their supply was met with commercial imports of milk powder. However, a successful milk cooperative was functioning in Anand, Gujarat, set up on the advice of Sardar Vallabhbhai Patel. In 1964, the National Dairy Development Board (NDDB) was set up with Dr Verghese Kurien as its chief. NDDB launched an ambitious programme, Operation Flood (OF), during the 1970s to make India self-reliant in milk production. The OF programme started a movement to create a network of village-level milk cooperative societies with a robust infrastructure for collection, processing, and marketing of milk. It introduced modern liquid milk processing plants and created a national milk grid for moving milk from surplus to deficit areas. The movement soon gathered momentum, and very quickly, milk production jumped to satisfactory levels. By 1976, regular commercial imports of milk had ceased. Since then, India has never looked back on milk production.

Besides self-reliance, India is the global leader in milk production for over a decade, with a total production of around 222 million tonnes in 2021-22. It makes up about 24 per cent of the total milk produced worldwide (931 million tonnes), while it was only six per cent of world milk production way back in 1973. Currently, India's milk production is growing at the rate of six per cent, whereas the global growth rate is around two per cent. The average per capita availability of milk worldwide is 308 grams, whereas in India it was 444 grams in 2022. This success, often referred to as 'White Revolution', has transformed the dairy sector into a most economically relevant enterprise, especially in rural areas. Around 80 million families are getting employment directly from the dairy sector, the majority of whom are small and marginal farmers, and landless households. Milk production in India is expected to reach 628 million tonnes in 2047, while demand for milk and dairy products is also expected to reach 517 million tonnes, which leaves 111 million tonnes of milk as surplus for export.

Moving to another colour of the spectrum, the 'Blue Revolution' signifies a surge in fisheries production attained after independence. Due to consistent efforts and promotional policies, India now stands as the second largest fish-producing country in the world, accounting for 7.58% of global production. In 1950-51, the total fish production was 0.752 million tonnes, which has now reached 16.3 million tonnes (2021-22) with an annual compound growth rate of 4.42 per cent. Currently, India is also a leading seafood exporter in the world. The fisheries sector provides livelihood to about 16 million fishermen and fish farmers at the primary level. The Government of India implemented a notable scheme called – 'Blue Revolution' —Integrated Development and Management of Fisheries for a period of five years (2016-16 to 2019-20). It focused mainly on increasing fisheries production and productivity in the inland and marine sectors of the country. The country has witnessed another revolution in the poultry sector by becoming the third-largest producer of eggs in the world. Often referred to

as the 'Silver Revolution', the country is currently producing 1,29,600 million eggs (2021-22), while it was 1,832 million during 1950-51.

Way Forward

The agriculture sector is experiencing several challenges in the form of climate change, deteriorating natural resources, low fertility and low productivity, and increasing demand for quality produce. To address such challenges and make Indian agriculture future-ready, the Government has taken initiatives like National Mission on Sustainable Agriculture, Agri-Tech Infrastructure Fund, Paramparagat Krishi Vikas Yojana, Rashtriya Krishi Vikas Yojana on a national platform. Such initiatives are promoting the application of science and technology in fields and farms with infrastructure support and market linkages to increase productivity and profitability. While natural farming is the new mantra, emerging technologies such as drones, remote sensing, precision agriculture, and IT applications are also finding their way into modern agriculture. As a recent phenomenon, agri-startups are providing farm solutions to farmers, mostly on a real-time basis, by employing digital tools and innovations. Various digital initiatives are also supporting farmers in the fields to increase efficiency and lower the cost of cultivation. To enhance the income of farmers, the Government has taken several initiatives across the agriculture and allied sectors spectrum. From direct financial support to crop insurance and institutional credit, farmers are at the core of income-enhancing schemes. Under the National Agriculture Market National Agriculture Market (eNAM) initiative, markets across the nation are now enabling farmers to get the best prices for their produce. Rising from self-reliance, Indian agriculture is now moving forward to become a global powerhouse of agriculture. ❑