

# AGRICULTURE AND FOOD MANAGEMENT: SECTOR OF THE FUTURE

*India's agricultural sector has demonstrated remarkable resilience in recent years, marked by consistent growth rates. This stability can be largely attributed to various government initiatives to enhance productivity, promote crop diversification, and increase farmers' income. A crucial factor influencing agricultural performance is the impact of weather conditions. Climate variability can present significant challenges; however, farmers with diverse income streams are better positioned to navigate these uncertainties. Allied activities such as animal husbandry, fisheries or agroforestry, can enable the farmers to mitigate the risks effectively. Various government initiatives are specifically designed to address these challenges.*

## INTRODUCTION

9.1 The 'Agriculture and Allied Activities' sector has long been the backbone of the Indian economy, playing a vital role in national income and employment. This sector contributes approximately 16 per cent of the country's GDP for FY24<sup>1</sup> (PE) at current prices and supports about 46.1 per cent of the population. Not only does its performance directly impact food security, but it also influences other sectors, sustaining livelihoods and supporting economic growth.

9.2 In recent years, the agriculture sector in India has shown robust growth, averaging 5 per cent<sup>2</sup> annually from FY17 to FY23, demonstrating resilience despite challenges.

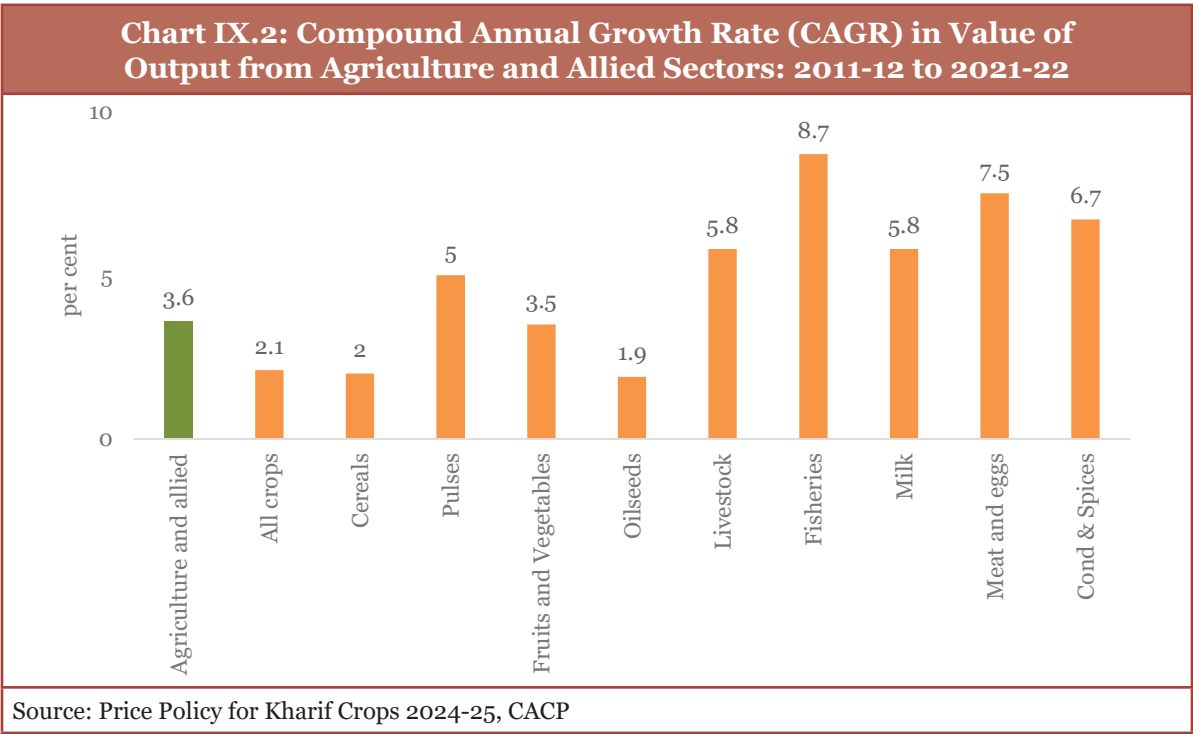
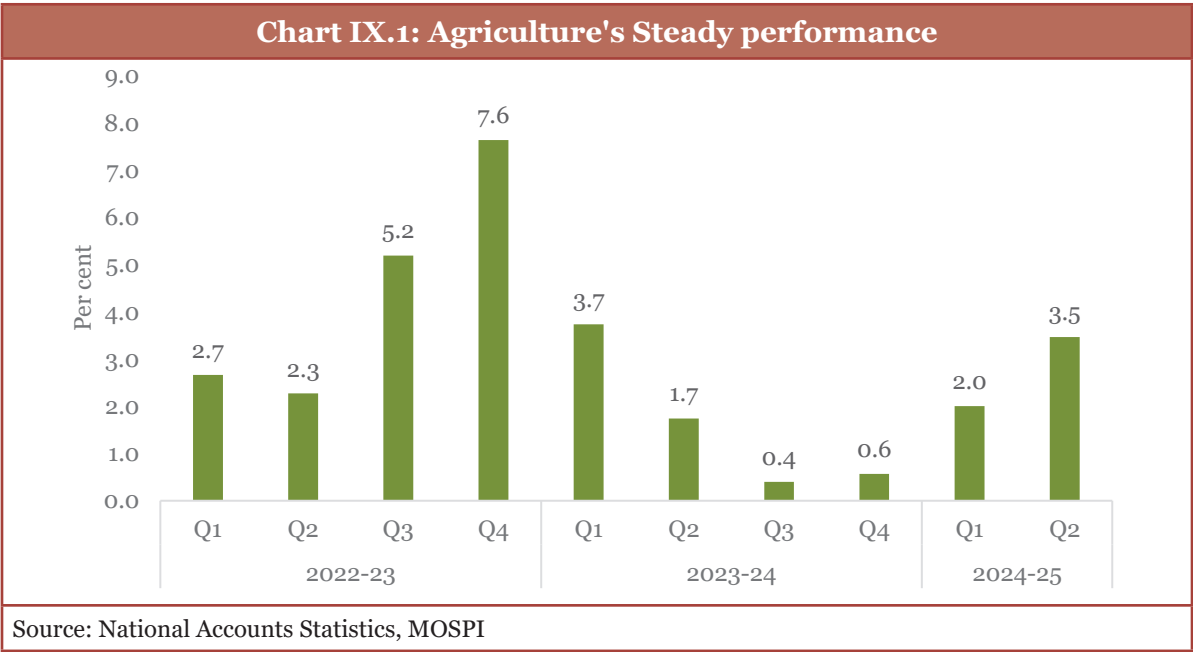
9.3 In the second quarter of the FY25 year, the agriculture sector recorded a growth rate of 3.5 per cent<sup>3</sup>. This performance represents a recovery compared to the previous four quarters, during which growth rates varied from a modest 0.4 per cent to 2.0 per cent. The recent rise in growth rate can be attributed to improved conditions, potentially driven by favourable weather patterns, advancements in agricultural practices, and government initiatives to enhance productivity and sustainability within the sector.

1 Ministry of Statistics and Program Implementation (MOSPI). <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2079024>

2 Ramesh Chand and Jaspal Rana, "Performance of Agriculture Sector 2014-24: Implications for Short-and Medium-term Strategy", Economic and Political Weekly, September 2024, 59(39):70-73

3 <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2079024>.

9.4 Assured remunerative prices, improved access to institutional credit, crop diversification, support for sustainable practices, and enhancement in productivity have played a crucial role in the sustained growth observed. Riding on good monsoon, kharif foodgrain production in 2024 is projected at 1647.05 Lakh Metric Tonnes (LMT), suggesting an increase of 89.37 LMT compared to the previous year and 124.59 LMT above the average kharif foodgrain output<sup>4</sup> bodes well for food security. Agricultural income has increased at 5.23 per cent annually over the past decade, compared to 6.24 per cent for non-agricultural income and 5.80 per cent for the overall economy.



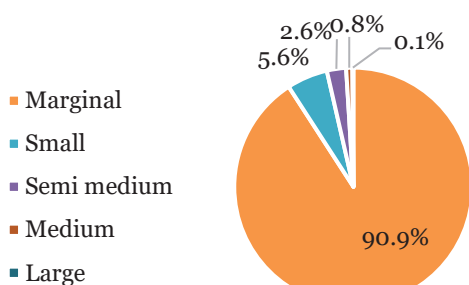
4 First Advance Estimates for 2024-25, Ministry of Agriculture and Farmers Welfare

9.5 India's agriculture is characterised by diversity, with performance varying significantly across different segments and states. As a major global cereal producer, India accounts for 11.6 per cent of the world's total output. However, crop yields in the country are considerably lower compared to those of other leading producers, underscoring the need for productivity improvements. The crop sector has experienced a modest compound annual growth rate (CAGR) of 2.1 per cent, from FY13 to FY22. This increase is also largely driven by notable increases in the production of fruits, vegetables, and pulses.

### Box IX. 1 : India's Floriculture: A Sunrise Industry

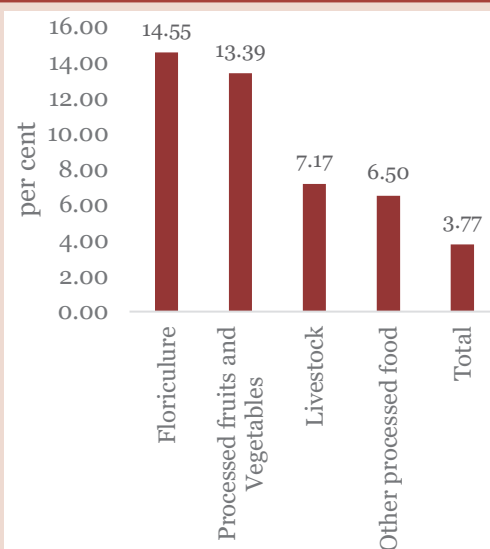
India's floriculture industry has grown into a high-performing sector, earning its status as a "sunrise industry" with a 100 per cent export orientation<sup>5</sup>. Driven by a growing global demand for flowers, floriculture has evolved into a key commercial venture within agriculture. Commercial floriculture is particularly lucrative, offering higher returns per unit area than many traditional field crops. Profitable avenues in commercial floriculture include cut-flower production, loose-flower production, dry flowers, cut greens, pot plants, flower seeds, perfumes and essential oils. Ramachandra et al. (2007)<sup>6</sup> found that including flowers in rice-based crop sequences gave higher net returns than other sequences, viz. rice-soybean, rice-bell pepper, rice-fodder maize, rice-cowpea and rice-radish. Further, inter-cropping flowers are more profitable compared to the options of cereals, pulses, vegetables and oilseeds. With subsidy support and crop loan financing, it is a promising venture for marginal and small landholdings, which constitute more than 96 per cent of the total landholdings and 63 per cent of the area of cultivation under floriculture.

**Chart: IX.3 Distribution of operational landholdings under floriculture**



Source: Agriculture census, 2015-16

**Chart: IX.4 Exports of agri-and processed foods (April-Oct FY25 over April-Oct FY25)**



Source: APEDA

<sup>5</sup> [https://apeda.gov.in/apedawebsite/SubHead\\_Products/Floriculture.htm](https://apeda.gov.in/apedawebsite/SubHead_Products/Floriculture.htm).

<sup>6</sup> Ramachandra C., Anwarulla M. S, Janardhan G. and Murthy P. (2007) Production potential and economics of rice-based cropping systems in hill zone of Karnataka, India. International Journal of Agriculture Sciences. 3(2), 127-9.

The shift from cultivating traditional flowers to export-focused cut flowers highlights the industry's transformation. Entrepreneurs across states like Tamil Nadu, Karnataka, Madhya Pradesh, West Bengal, Uttar Pradesh and Maharashtra have capitalized on this opportunity, establishing sophisticated export-oriented floriculture units. In FY24, approximately 297 thousand hectares were dedicated to floriculture, yielding an estimated 2,284 thousand tonnes of loose flowers and 947 thousand tonnes of cut flowers. During the same period, India exported 19,678 metric tonnes of floriculture products, earning ₹717.83 crore (USD 86.63 million). Key export destinations included the USA, Netherlands, UAE, UK, Canada, and Malaysia. With its high growth trajectory and promising export potential, India's floriculture industry is blooming as a vital player in the global flower trade<sup>7</sup>.

9.6 The slower growth rate of oilseeds at 1.9 per cent raises concerns, especially considering India's heavy reliance on imports to satisfy domestic edible oil demands. High-value sectors such as horticulture, livestock, and fisheries have emerged as the primary contributors to the overall growth of agriculture. Among these, the fishery sector has demonstrated the highest compound annual growth rate (CAGR) at 13.67 per cent, followed by livestock with a CAGR of 12.99 per cent<sup>8</sup> during FY15 to FY23(at current prices).



9.7 Diversity is also seen in inter-state variations in growth observed from 2011-12 to 2020-21. Andhra Pradesh was the leading performer with a CAGR of 8.8 per cent in agriculture and allied sectors, excluding forestry and logging. Madhya Pradesh followed with 6.3 per cent, and Tamil Nadu came in third with 4.8 per cent among major states.<sup>9</sup>

7 [https://apeda.gov.in/apedawebsite/SubHead\\_Products/Floriculture.htm](https://apeda.gov.in/apedawebsite/SubHead_Products/Floriculture.htm).

8 Department of animal Husbandry and Dairying.

9 Price Policy, Report Kharif 2024-25, Commission for Agriculture Costs and Prices.

These states have diversified towards crops where yield is high. For example, Andhra Pradesh diversified towards jowar, Madhya Pradesh towards moong and Tamil Nadu towards maize. Even so, there is significant potential to enhance productivity and reduce the yield gap compared to the global average.

9.8 As we look to the future, it's important to consider how changing dietary preferences, driven by rising incomes, will influence the agricultural sector's growth trajectory. The increasing consumption of non-food grains, particularly horticultural products, livestock, and fisheries, will be significant. Given the perishable nature of these high-value commodities, effective post-harvest management and robust marketing infrastructure are essential. This endeavour should be supported by the active involvement of Farmer Producer Organizations (FPOs), cooperatives, and Self-Help Groups (SHGs). Furthermore, substantial investment from the private sector would also be vital to aid small-scale farmers.

#### **BOX IX.2 : Transforming Rural Economies: The Rise of Horticulture**

India's horticulture sector is more productive and profitable than traditional agriculture, emerging as a fast-growing industry. This can be seen from the fact that India is also a leading exporter, shipping 343,982.34 MT of fresh grapes worth ₹3,460.70 crore (USD 417.07 million) globally in 2023-24<sup>10</sup>. Key grape-growing states are Maharashtra, Karnataka, Tamil Nadu, and Mizoram. Maharashtra leads in production, contributing over 67 per cent of total output with the highest productivity in 2023-24<sup>11</sup>. Grape cultivation has significantly improved the livelihoods of Nashik farmers where export-quality grapes fetch higher prices (₹65-70/kg) than domestic markets. This economic upliftment has attracted rural youth to grape farming. Farmers have adopted advanced technologies like real-time monitoring systems to ensure optimal grape quality. The Nashik grape story shows how export-oriented agriculture, technology, and collective efforts can transform a region's socio-economic conditions.

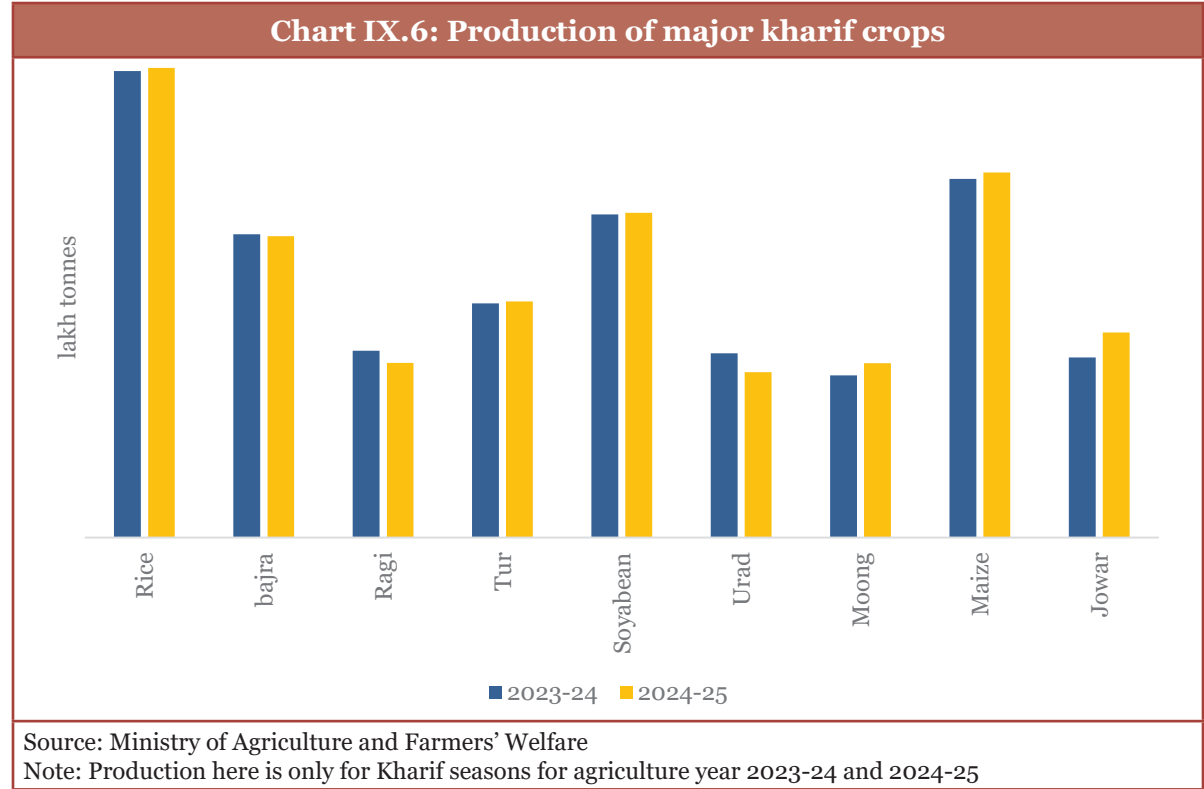
9.9 The government is implementing a range of initiatives aimed at enhancing agricultural productivity and increasing farmers' incomes, in alignment with the recommendations put forth in the Doubling Farmers' Income (DFI) Report 2016. This report highlighted essential strategies for improving crop and livestock productivity, boosting cropping intensity, and diversifying into high-value crops. Committed to promoting greater input efficiency and adopting sustainable production practices, the government is pursuing initiatives such as Per Drop More Crop (PDMC) and various actions under the National Mission on Sustainable Agriculture (NMSA). These measures include using alternative and organic fertilisers to enhance productivity and sustainability. Furthermore, digital initiatives like the Digital Agriculture Mission and the e-National Agriculture Market (e-NAM) have been launched to encourage the adoption of innovative agricultural technologies and improve price discovery mechanisms. Additionally, the government provides income support to farmers through assured remunerative prices for their produce, alongside programs such as the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN).

<sup>10</sup> [https://apeda.gov.in/apedawebsite/six\\_head\\_product/Fresh\\_Fruits\\_Vegetables.htm](https://apeda.gov.in/apedawebsite/six_head_product/Fresh_Fruits_Vegetables.htm)

<sup>11</sup> Ibid.

**CROP PRODUCTION: Incentivising productivity increase, crop diversification and efficiency in the use of inputs**

9.10 Despite the increase in crop production, further enhancements in productivity across various crops and regions are vital for boosting performance and positively influencing farmers' incomes. Productivity is closely linked to on-farm and post-harvest inputs such as improved access to quality seeds, better irrigation facilities, efficient water management practices, effective extension services, soil health improvements, modern post-harvest infrastructure, and accessible markets. Additionally, agricultural price policies play a crucial role in facilitating informed decision-making by protecting farmers from market price volatility and encouraging them to diversify their crops, promoting sustainable agricultural practices.



9.11 The Minimum Support Price (MSP) for essential crops such as wheat, rice, pulses, oilseeds, and nutri-cereals acts as a safety net for farmers, reassuring them of a guaranteed minimum price for their crops from the government. This mechanism also serves as a guiding signal for farmers in planning their future crop compositions. In the Union Budget of 2018-19, the government decided the principle of fixing MSP at a level of at least 1.5 times the weighted average cost of production for these crops. The support provides the necessary returns to promote sustainable farming practices and encourage farmers to focus on cultivating key crops. The government has raised the MSP for nutri cereals (Shree Anna), pulses, and oilseeds as part of these initiatives. For the fiscal year FY25, the MSP for arhar and bajra has been increased by 59 per cent and 77 per cent over the weighted average cost of production, respectively. Moreover, the MSP for Masur has risen by 89 per cent, while rapeseed has seen an impressive increase of 98 per cent.



## SEEDS-QUALITY AND USE OF FERTILISERS: The Critical Differentiator

9.12 The adage “As you sow, so shall you reap” effectively reflects the significance of seed quality and the accessibility of seeds in sufficient quantities by farmers in promoting healthy crop growth. In the 2023-24 season, ICAR produced 1.06 lakh quintals of breeder seeds encompassing 1,798 varieties across 81 crops for further multiplication. Given the impact of weather on agricultural output, research into climate-resistant seeds has become a priority, with 2,177 of the 2,593 new varieties released since 2014 specifically addressing this challenge. To ensure that these varieties are readily available, seed banks have been established. In regions such as north-western India, heat-tolerant wheat varieties have seen widespread adoption to alleviate the effects of heat stress. In FY24, demonstrations of climate-resilient technology packages were conducted in 121 vulnerable districts under the National Innovations in Climate Resilient Agriculture initiative.

9.13 Soil degradation, particularly the decline in organic carbon content, poses a significant challenge to Indian agriculture. Many soils in India are deficient in organic carbon, macronutrients, and essential micronutrients such as boron, iron, and sulphur. This deterioration of soil health adversely affects fertility, productivity, and overall agricultural sustainability. To achieve optimal crop yields while ensuring environmental sustainability, it is imperative to use fertilisers judiciously. Recently introduced, ‘Urea Gold’ combines urea with sulphur, minimizing wastage and enhancing plant nutrient uptake. Additionally, the use of drones and fertigation<sup>12</sup> techniques are being implemented to optimize fertiliser applications. The Programme for Restoration, Awareness Generation, Nourishment, and Amelioration of Mother Earth (PM-PRANAM) initiative incentivises states to adopt alternative fertilisers such as Nano Urea, Nano Diammonium phosphate (DAP), and organic fertilisers. By promoting these sustainable options, the government aims to improve soil health, reduce environmental pollution, and boost agricultural productivity.

## RAINFALL AND IRRIGATION SYSTEM: Building Efficiency and Extending Coverage

9.14 Precipitation is crucial in the global water cycle, serving as a primary source for freshwater replenishment, vital for various ecosystems and human activities. The repercussions of climate change on rainfall patterns are profound, particularly concerning agricultural practices that rely heavily on consistent and predictable weather conditions (Porter et al., 2014)<sup>13</sup>.

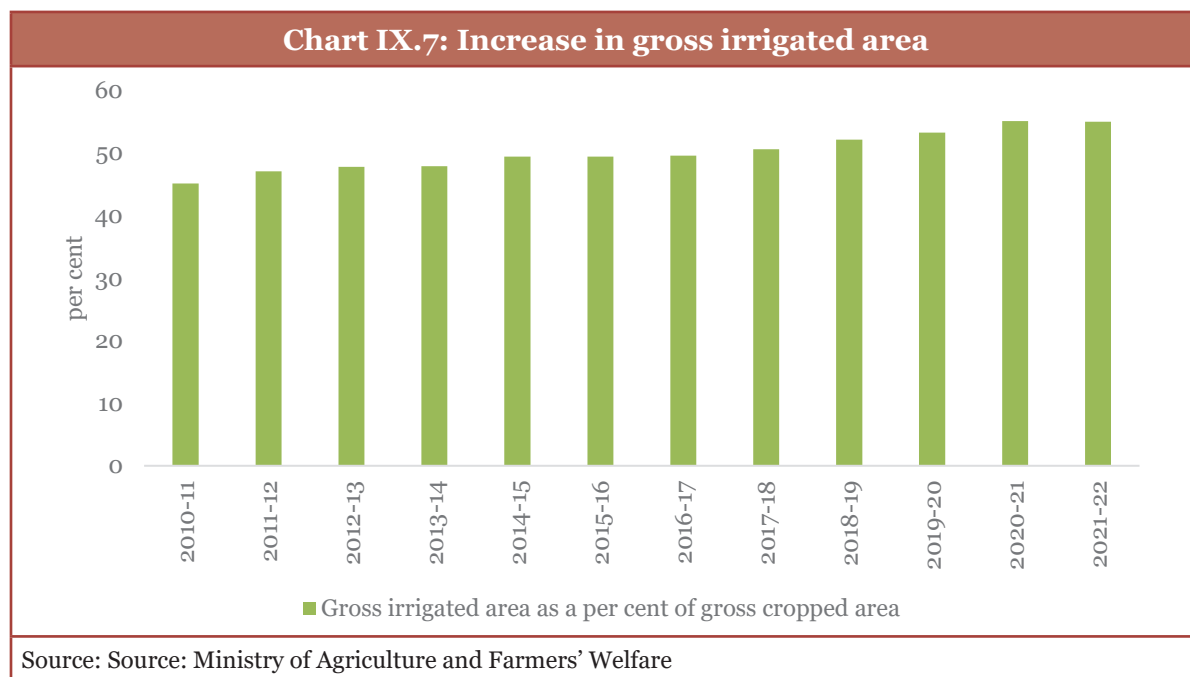
9.15 In India, while the volatility in agricultural growth has notably diminished over time due to targeted interventions, the sector remains highly vulnerable to weather

<sup>12</sup> Fertigation is a method of fertiliser application in which fertiliser is incorporated within the irrigation water by the drip system.

<sup>13</sup> Porter, J. R., Xie, L., Challinor, A. J., Cochrane, K., Howden, S. M., Iqbal, M. M., Lobell, D. B., and Travasso, M. I. (2014). Food security and food production systems. In Field, C. B., Barros, V. R., Dokken, D. J., Mach, K. J., Mastrandrea, M. D., Bilir, T. E., Chatterjee, M., et al., eds., Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.

variability, with only about 55 per cent of the net sown area receiving irrigation<sup>14</sup>. A substantial portion of the agricultural land relies on rain-fed systems, making it especially susceptible to fluctuations in precipitation. Moreover, more than two-thirds of India's agricultural land faces the threat of drought, with national estimates indicating a 35 per cent probability of drought occurrences<sup>15</sup>. This risk is not uniform across the country; it varies considerably based on geographies. For instance, in dry-humid regions, the likelihood of drought is relatively lower at about 20 per cent, while in arid zones, it can exceed 40 per cent. Such disparities emphasise the urgent need for region-specific strategies to mitigate drought risk<sup>16</sup>.

9.16 The implications of erratic monsoon patterns are particularly pronounced for marginal and small-scale farmers, representing approximately 85 per cent of India's agricultural holdings. These farmers typically cultivate on plots less than 2 hectares in size, making them highly vulnerable to the impacts of climate variability.<sup>17</sup>



9.17 Climate change is a problem because it accentuates weather variability. There has been an increase in the frequency of dry spells during the summer monsoon season, which are 27 per cent more common from 1981 to 2011 compared to 1951 to 1980<sup>18</sup>.

<sup>14</sup> Agriculture statistics at a glance 2022-23, Ministry of Agriculture.

<sup>15</sup> NABARD Climate Change and Risk Management in Indian Agriculture, 2022.

<sup>16</sup> Krishnan, R., Sanjay, J., Gnanaseelan, C., Mujumdar, M., Kulkarni, A., & Chakraborty, S. (2020). Assessment of climate change over the Indian region: a report of the ministry of earth sciences (MOES), government of India (p. 226). Springer Nature

<sup>17</sup> Kumar, S., Mishra, A. K., Pramanik, S., Mamidanna, S., & Whitbread, A. (2020). Climate risk, vulnerability and resilience: Supporting livelihood of smallholders in semiarid India. *Land use policy*, 97, 104729.

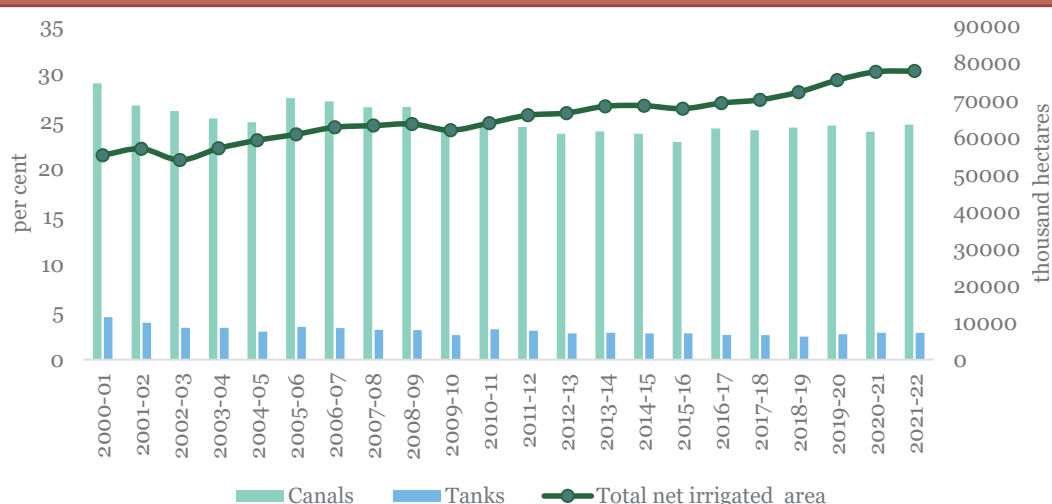
Birthal, P S, P K Joshi, D S Negi and S Agarwal (2014): Changing Sources of Growth in Indian Agriculture: Implications for Regional Priorities for Accelerating Agricultural Growth, IFPRI Discussion Paper 1325, International Food Policy Research Institute (IFPRI), Washington D.C.

<sup>18</sup> Assessment of Climate Change over the Indian Region: A Report of the Ministry of Earth Sciences (MoES), Government of India, 2020



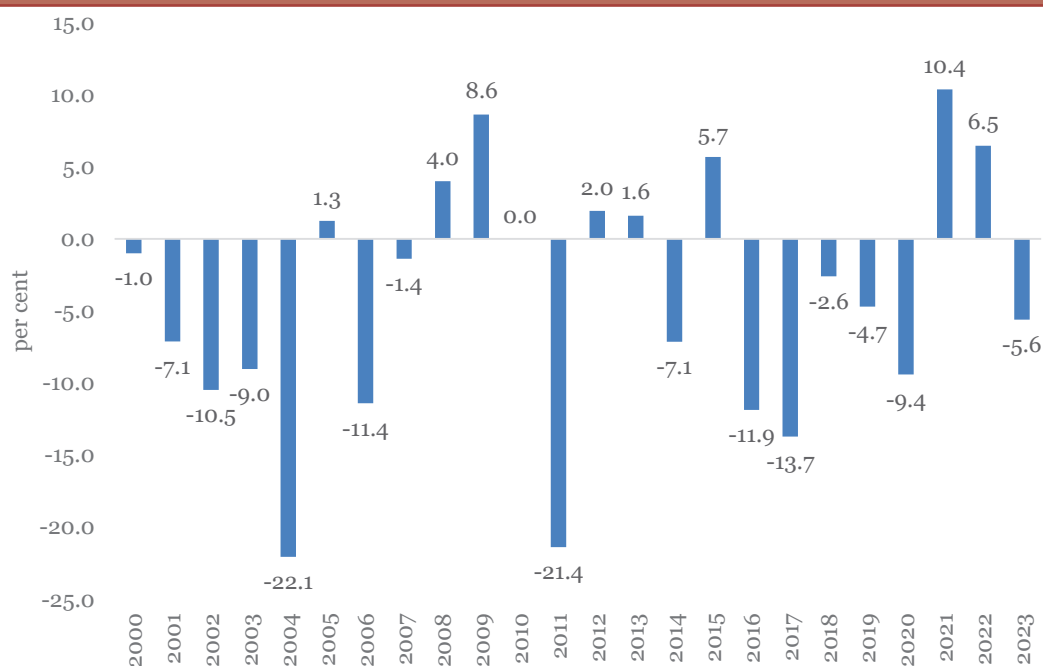
Not only has there been an increase in the number of years with deficient rainfall at an all-India level, but more subdivisions<sup>19</sup> have experienced rainfall deficits- reflecting an increase in the frequency and the geographic spread of droughts. At the same time, there are also more intense short wet spells. In central India, the frequency of extreme daily rainfall events exceeding 150 mm has increased by about 75 per cent from 1950 to 2015<sup>20</sup>.

**Chart IX.8: Sources of irrigation**



Source: Source: Ministry of Agriculture and Farmers' Welfare

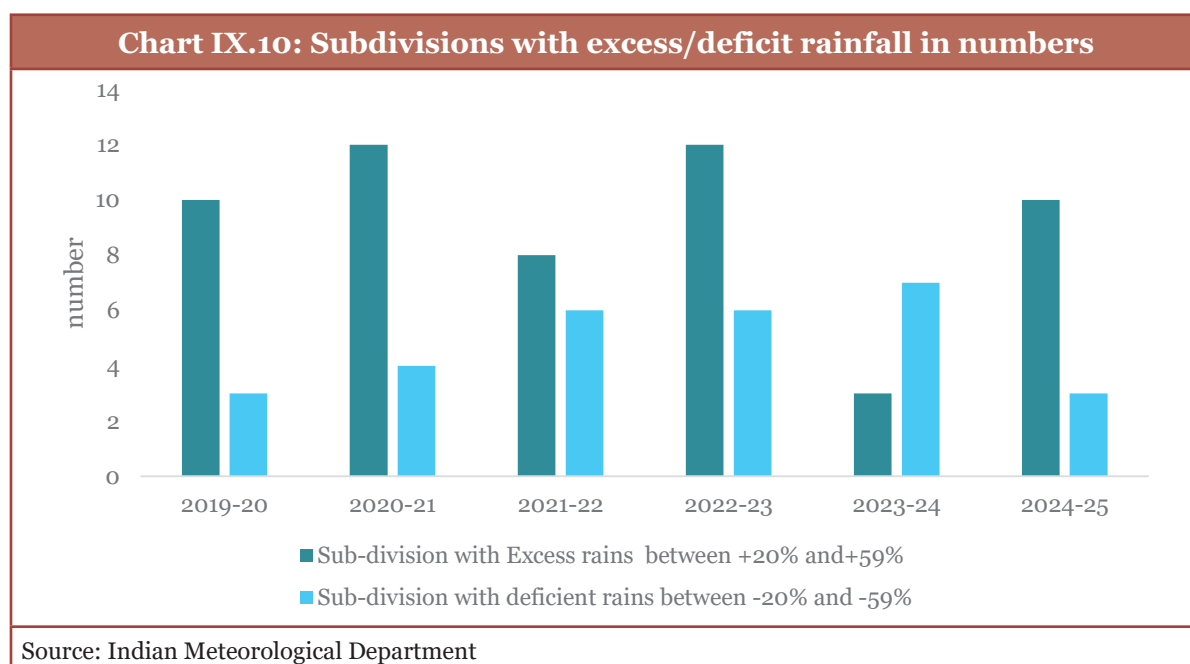
**Chart IX.9: Departure from average in annual rainfall in per cent since 2000**



Source: Indian Meteorological Department

<sup>19</sup> Subdivisions by Indian Meteorological Department are based on rainfall.

<sup>20</sup> Ibid



9.18 Several studies have also assessed the overall effect of climate change on agricultural production. Negi and Ramaswami (2024)<sup>21</sup> examined the relationship between crop yields and rainfall across India at the district level for nine key crops during the kharif season. They found a strong link between significant rainfall shortfalls and substantial crop yield losses. This statistical phenomenon is known as lower tail dependence, indicating that the correlation between yield losses and rainfall deficits is stronger for extreme rainfall deficiencies than for minor variations. Other studies have indicated that a potential 2°C rise in annual temperature and a 7 per cent increase in annual rainfall by 2099 could lead to an 8-12 per cent decline in Indian agricultural productivity<sup>22</sup>. Birthal et.al (2021)<sup>23</sup> found that heat stress harmed crop yield, which worsened over time. Most studies have suggested that droughts and heat waves negatively impact agricultural productivity compared to floods and cold waves in India. It is, therefore, pertinent to increase the area under irrigation and diversify towards heat and water-resistant crops.

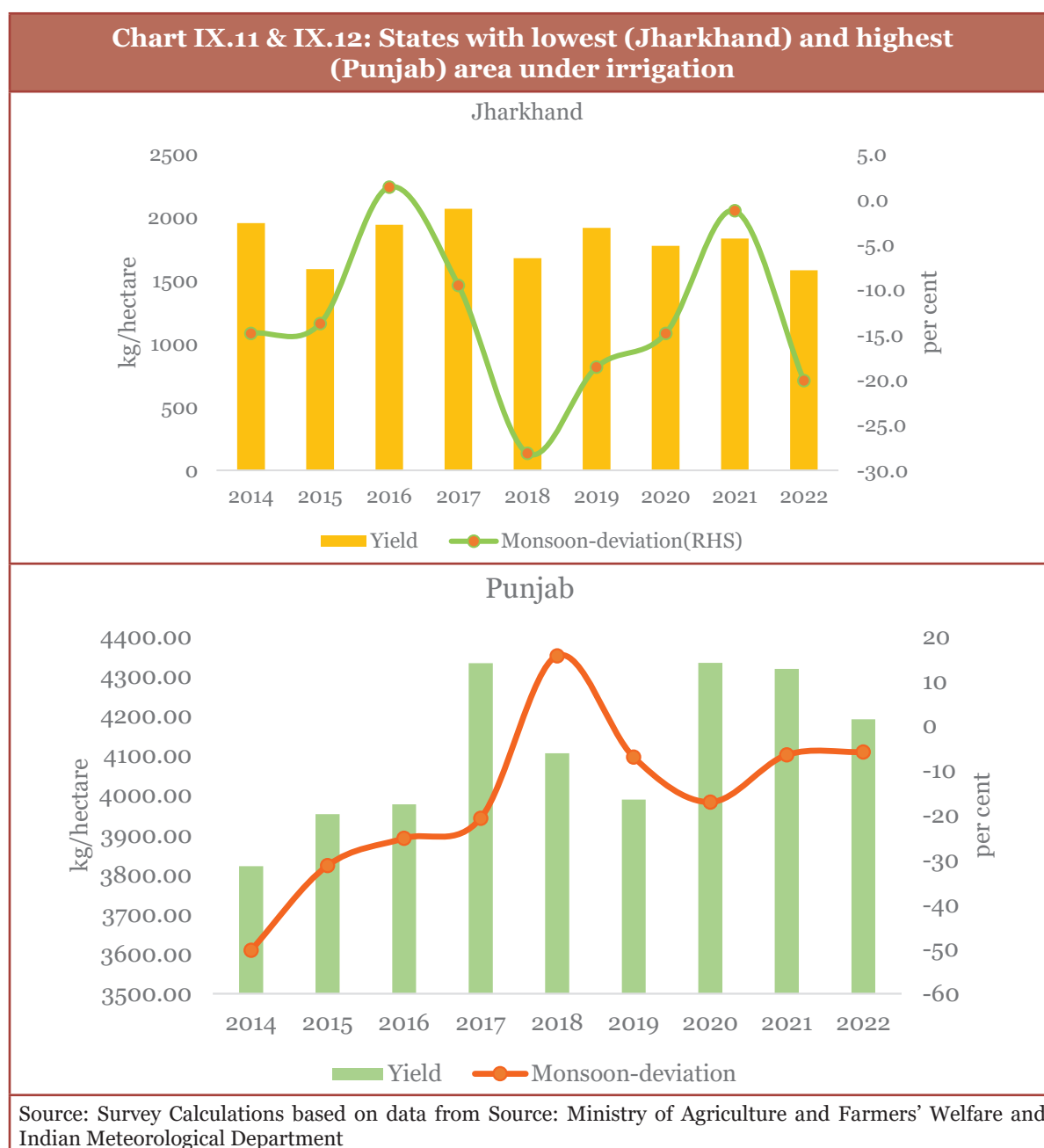
9.19 Between FY16 and FY21, India experienced a significant increase in irrigation area coverage and intensity. The coverage of irrigation area has increased between FY16 and FY21 from 49.3 per cent to 55 per cent of the gross cropped area (GCA), while irrigation intensity has risen from 144.2 per cent to 154.5 per cent. States such as Punjab, Haryana, Uttar Pradesh, and Telangana exhibit high irrigation coverage of their gross cropped area, with figures around 98 per cent, 94 per cent, 84 per cent, and 86 per cent, respectively. In contrast, states like Jharkhand and Assam lag significantly, with irrigation coverage below 20 per cent, underscoring the necessity to improve irrigation

21 Negi, D. S., & Ramaswami, B. (2024). Basis risk and the demand for catastrophic rainfall insurance. *QOpen*, 4(1), qoae009.

22 NABARD Climate Change and Risk Management in Indian Agriculture, 2022.

23 Birthal, P S, J Hazrana, D S Negi and G Pandey (2021b): "Benefits of Irrigation against Heat Stress in Agriculture: Evidence from Wheat Crop in India", *Agricultural Water Management*, Vol. 255 , No. C.

and water management practices in regions with lower irrigation levels.



9.20 The government has prioritised irrigation development and water conservation practices to enhance access to irrigation facilities. Since the FY16 fiscal year, the government has been implementing the Per Drop More Crop (PDMC) initiative, a component of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), to promote water efficiency. Financial assistance is provided at 55 per cent of the total project cost for small and marginal farmers, and 45 per cent for other farmers for installation of micro irrigation under PDMC. From FY16 to FY25 (end of Dec. 2024), ₹ 21968.75 crore was released to states for implementation of PDMC Scheme and an area of 95.58 lakh ha has been covered under which is about 104.67 per cent higher as compared to the Pre-PDMC period. Further, in addition to PDMC the micro irrigation Fund (MIF)

supports innovative projects through 2 per cent interest subvention to states on loans availed under MIF. Loans amounting to ₹4709 crore has been approved of which ₹3640 crore has been disbursed so far.

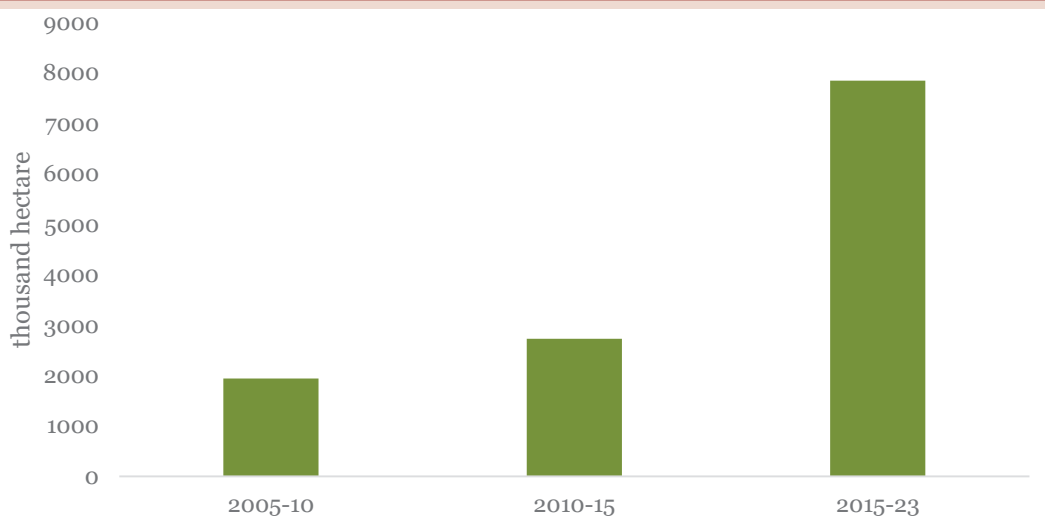
9.21 The Rain-fed Area Development (RAD) program has been implemented to develop and conserve natural resources alongside farming systems as part of the National Mission for Sustainable Agriculture (NMSA) since FY15. From FY22 onwards, the RAD scheme has been integrated into the Rashtriya Krishi Vikas Yojana (RKVY). So far, ₹1,858.41 crore have been allocated, covering an area of 8.00 lakh hectares under the RAD program since its inception.

9.22 According to a study by the A.T.E Chandra Foundation, a community-led, technology-enabled model for rejuvenating water bodies (RWB) across India can be an important intervention to enhance rural water security. The Composite Land-use Restoration and Assessment Tool (CLART GIS) and the AVNI Gramin app can identify water bodies with potential for groundwater recharge and enable monitoring of such interventions to restore water bodies through geo-tagged images and verification at the farmer level. RWB could, therefore, be a cost-effective solution to India's water challenges, offering environmental, economic, and social benefits.

### BOX IX.3 : Micro-Irrigation: Unlocking the potential

Water scarcity is a challenge for Indian agriculture, and promoting micro-irrigation is extremely important in reducing the water footprint. Micro-irrigation holds significant potential for India's 140 million hectares of arable land. Even though there is an increase in area under micro-irrigation in India (8 per cent of irrigated area), the pace is still slow as compared to the USA (68.6 per cent) and China (13.7 per cent).<sup>24</sup>

**Chart IX.13: Area Under Micro-irrigation**



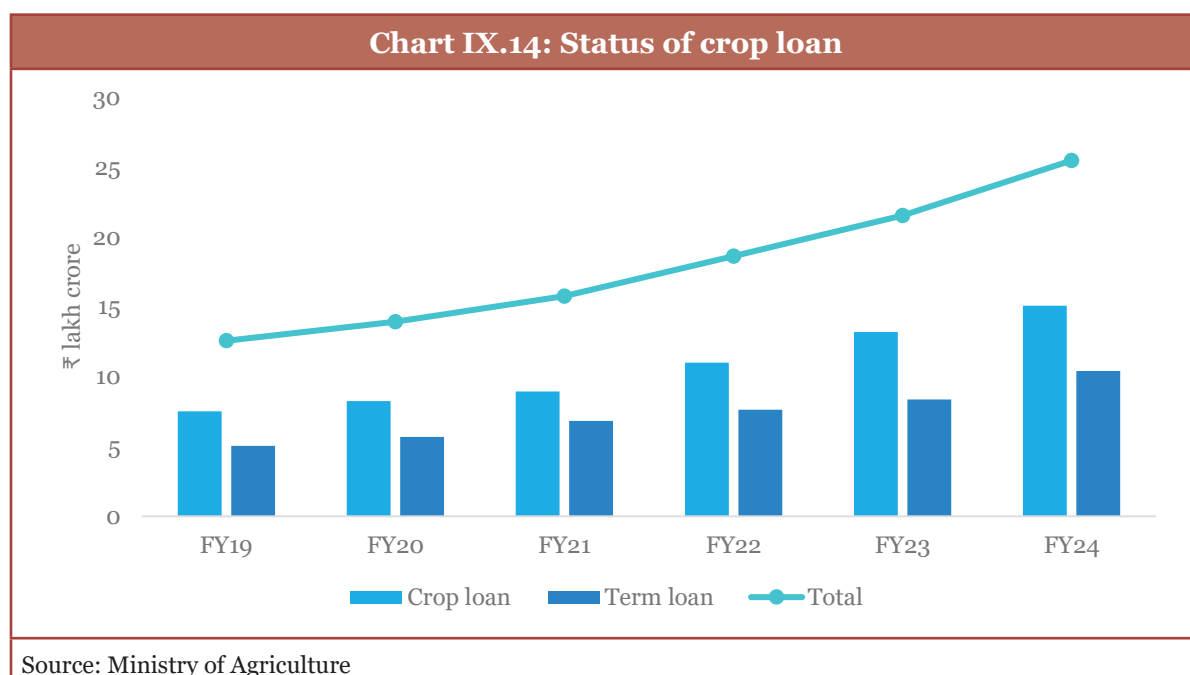
Source: Ministry of Agriculture and Farmers Welfare

Note: Area under PDMC and other central sponsored schemes

A study by (Narayanamoorthy et al,2024)<sup>25</sup> examined the impact of drip irrigation on five horticultural crops—brinjal, tomato, banana, watermelon, and mango—in Tamil Nadu, India. The study suggested that drip irrigation enhances agricultural outcomes. Compared to flood irrigation, it reduces water consumption by 39-55 per cent and boosts crop yields by 33-41 per cent due to targeted water delivery. This efficiency translates to substantial economic benefits for farmers, with profit margins increasing by 52.92-114.50 per cent depending on the crop (e.g., brinjal, mango). In a similar vein, another study (D. Suresh Kumar et al, 2010) suggested that the drip irrigation method has demonstrated a substantial impact on resource conservation, reduction in cultivation costs, improved crop yields, and enhanced farm profitability<sup>26</sup>.

## AGRICULTURE CREDIT: A critical input

9.23 Providing adequate credit support to all farmers, especially small and marginal farmers and vulnerable sections of society, is crucial to improving agricultural productivity and income.



9.24 The Government of India introduced the Kisan Credit Card (KCC) to enable farmers to meet their short-term working capital requirements promptly and hassle-free. This has helped enhance the working capital flow to agriculture and allied sectors. As of March 2024, the country has 7.75 crore operational KCC accounts with a loan outstanding of ₹9.81 lakh crore. KCC was further extended to meet the working capital needs of fisheries and animal husbandry in 2018-19, along with the enhancement

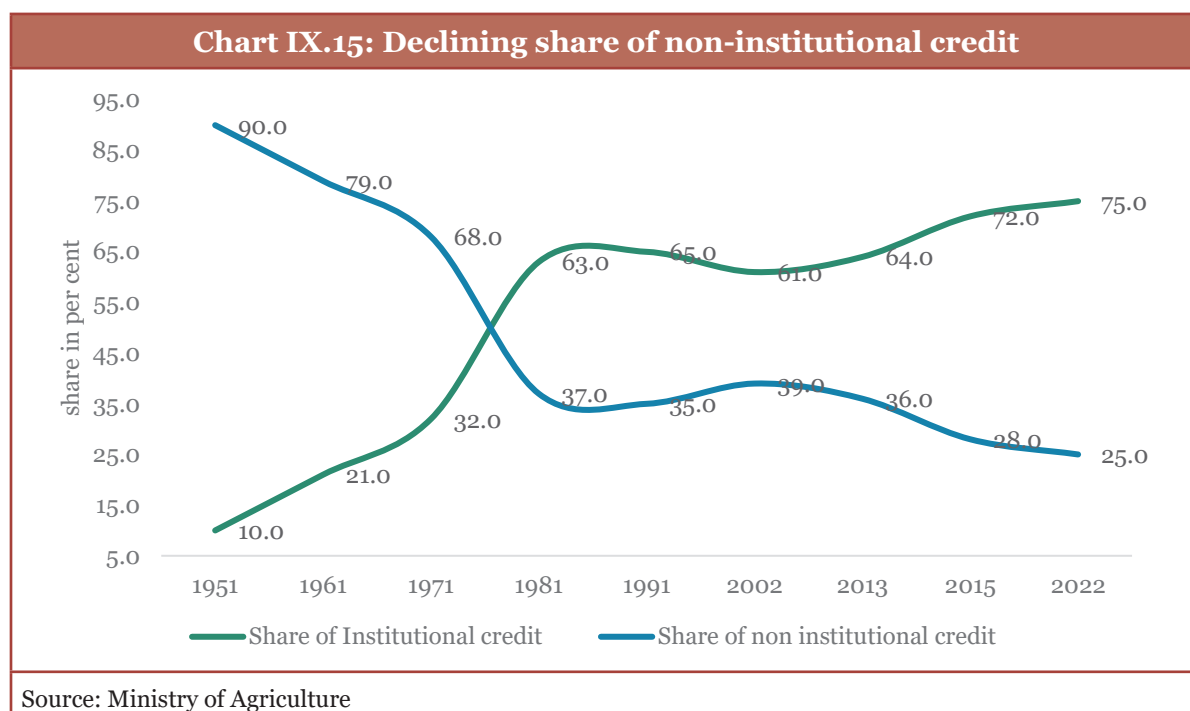
25 Narayanamoorthy, A., Jothi, P., Suresh, R., & Sujith, K. S. (2024). Can Drip Method of Irrigation Transform Yield and Income of Horticultural Crops? Evidence of Five Crops from Tamil Nadu. *Indian Journal of Agricultural Economics*, 79(3), 455-468.

26 Kumar, D. S., & Palanisami, K. (2010). Impact of drip irrigation on farming system: evidence from southern India. *Agricultural Economics Research Review*, 23(2), 265-272.

of the limit for collateral-free loans to ₹1.6 Lakh. As of 31 March 2024, 1.24 lakh KCC and 44.40 lakh KCC were issued to fisheries and animal husbandry activities, respectively.

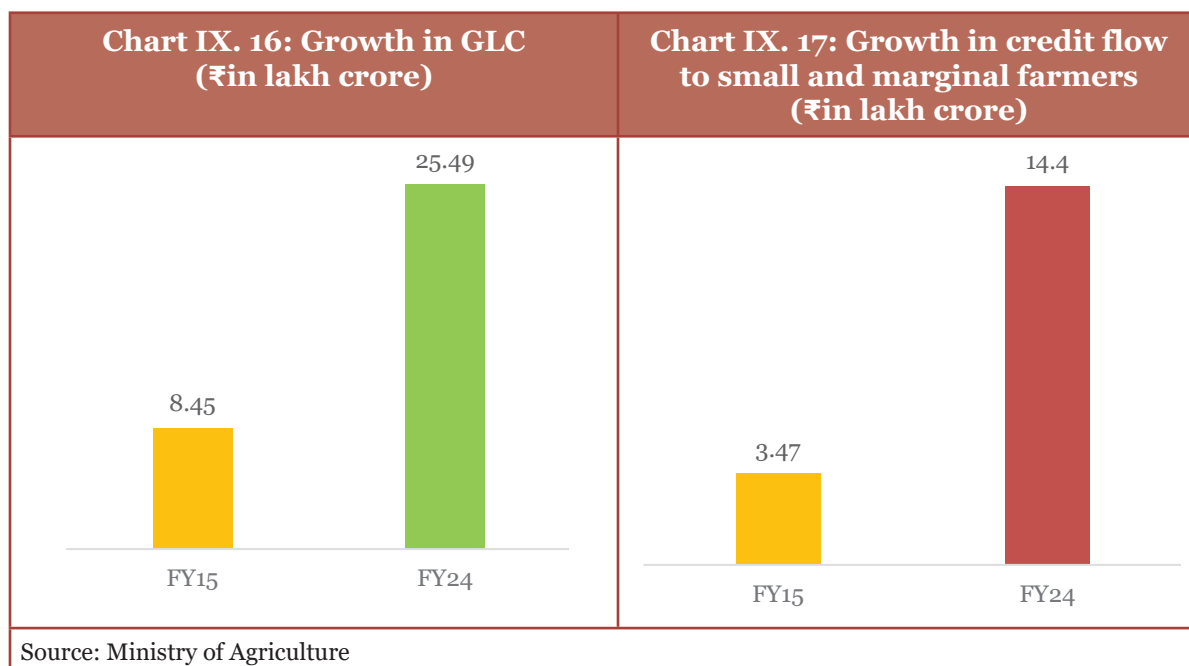
9.25 In addition to interventions such as the Modified Interest Subvention Scheme (MISS), which provides short-term agri-loans through KCC for working capital requirements at the concessional interest rate of 7 per cent, the Prompt Repayment Incentive (PRI) provides a 3 per cent incentive to farmers who repay on time. Starting from FY25, the claim processing has been digitised through the Kisan Rin Portal for faster and more efficient capturing and settlement of MISS claims.

9.26 To further support small and marginal farmers, banks must allocate 40 per cent of their Adjusted Net Bank Credit (ANBC) or Credit Equivalent Amount of Off-Balance Sheet Exposure (CEOBE), whichever is higher, to priority sectors, including agriculture. All the above measures have significantly reduced the reliance on non-institutional credit sources from 90 per cent in 1950 to around 25.0 per cent in FY22<sup>27</sup>.



9.27 Ground-level credit (GLC) to agriculture has also shown impressive growth with a CAGR of 12.98 per cent from 2014-15 to 2024-25. The GLC has risen from ₹8.45 lakh crore in 2014-15 to ₹25.48 lakh crore in 2023-24. Within this, the share of small and marginal farmers has significantly increased from ₹3.46 lakh crore (41 per cent) to ₹14.39 lakh crore (57 per cent) from 2014-15 to 2023-24.





#### BOX IX.4 : Kisan Rin Portal: Streamlining Agri Credit for Farmers' Prosperity



The Kisan Rin Portal (KRP) launched in September 2023 addresses key challenges in the Modified Interest Subvention- Kisan Credit Card (MISS-KCC) scheme. Previously, banks had to submit claims for Interest Subvention (IS) and Prompt Repayment Incentive (PRI) manually to the Reserve Bank of India (RBI) and NABARD, leading to significant delays and inefficiencies. The Kisan Rin Portal digitises this process, ensuring farmers and lending institutions benefit from quicker, seamless transactions, improving access to credit for agricultural needs.

- **Empowering Farmers with Seamless Access to Credit:** The portal simplifies the process, enabling access to low-cost credit not only for traditional cropping activities but also for dairy, poultry, fisheries, and beekeeping.
- **Benefiting Financial Institutions: Banks and Cooperatives:** With the portal, banks can submit automated digital claims, streamlining the entire process. This not only improves efficiency but also helps banks track and manage claims more effectively, facilitating prompt disbursement of benefits.
- **Reaching the Grassroots: Training and Support:** The KRP's impact extends to over 453 banks nationwide, with 1.89 lakh branches and 4.65 lakh users actively involved in processing claims.
- **Current Success and Achievements:** By 31 December 2024, it had processed claims worth ₹108336.78 crore including Interest Subvention (IS) and PRI. About 5.9 crore farmers that are currently getting benefitted under the MISS-KCC scheme, have been mapped through KRP.

9.28 The government also provides insurance for farmers through the Pradhan Mantri Fasal Bima Yojana (PMFBY). This scheme acts as a safety net for farmers against crop losses due to natural calamities, pests, and diseases. As the largest crop insurance program in the world in terms of farmer enrolment and the third-largest by premiums, PMFBY offers comprehensive risk coverage from the pre-sowing to post-harvest stages. By ensuring financial stability, the scheme encourages farmers to adopt modern agricultural practices and technologies, ultimately enhancing agricultural productivity and food security. In response to recommendations from various committees, the scheme has recently launched several technological interventions, such as YES-TECH, WINDS, and CROPIC<sup>28</sup>. These advancements have increased transparency within the scheme ecosystem by minimizing human intervention and fostering greater trust among stakeholders, including implementing States/UTs and insurance companies. The participation of State governments and insurers has increased to 24 and 15, respectively, in FY25, up from 20 and 11 in the 2020-21. Additionally, these interventions have contributed to a 32 per cent reduction in premium rates compared to previous years. As a result, in the FY24 period, the number of enrolled farmers reached 4 crore, a 26 per cent increase from 3.17 crore in the FY23 period. The insured area also expanded to 600 lakh hectares in FY24, reflecting a 19 per cent rise from 500 lakh hectares in FY23. Both the acreage and farmer enrolment figures under the scheme are at an all-time high.

### **AGRICULTURE MECHANISATION: Facilitating access**

9.29 The high machinery cost presents a significant barrier to promoting farm mechanisation among small and marginal farmers. Custom hiring arrangements can enhance these farmers' adoption of farm mechanisation, particularly in regions where mechanisation is currently limited. The Sub-Mission on Agricultural Mechanisation (SMAM) supports state governments with training and demonstrations related to agricultural machinery, in establishing Custom Hiring Centres (CHCs), and assisting farmers in acquiring various farming equipment. Further, farm machinery banks enable the renting of machinery at affordable rates, thereby promoting access to high-tech machinery for small and marginal farm holdings in areas with low levels of mechanisation. As of 31 December, 26,662 CHCs were established under this initiative, with 138 CHCs set up in the year FY25 alone.

9.30 Furthermore, the government has promoted a recently approved scheme aimed at providing drones to Women SHGs. This initiative targets 15000 selected Women SHGs to offer rental services to farmers for agricultural purposes, including for the application of fertilisers and pesticides. Central financial assistance of 80 percent of the drone's cost and related ancillary charges, up to a maximum of ₹8 lakh, will be granted to the women SHGs for drone purchases. This scheme will also deliver sustainable business and livelihood support to the SHGs, enabling them to generate an additional income of at least ₹1 lakh per annum.

<sup>28</sup> Weather Information and Network Data Systems (WINDS), Yield Estimation System based on Technology (YES-Tech), Collection of Real Time Observations and Photographs of Crops (CROPIC) provide real time data on weather, yield and uploading full size photos of crops.

## **AGRICULTURE EXTENSION: The Enabler**

9.31 Agricultural extension is vital in disseminating knowledge, enhancing productivity, and promoting sustainable agricultural practices. The government is implementing the Sub-Mission on Agricultural Extension (SMAE) to bolster agricultural extension services, enhance entrepreneurship and improve productivity in the agricultural sector throughout India. A key component of the SMAE is the support provided by the Agricultural Technology Management Agency (ATMA), which focuses on sharing the latest agricultural technologies to boost production. The initiatives include farmer training, demonstrations, exposure visits, kisan melas, mobilisation of farmer groups, and the establishment of farm schools. During the FY24 period, over 3.66 million farmers benefitted from these extension activities, with an additional 4.49 million having availed themselves of these benefits by November 2024. Furthermore, the government has launched the short duration skill training of rural youth scheme to offer short-term skill training to rural youth and farmers in agriculture and related fields. So far, 20940 candidates were trained as of November 2024 of which 5504 were trained in FY25. To address the training needs of middle-level field extension workers, the government has established four regional extension education institutes located in Haryana, Telangana, Gujarat, and Assam. During FY24, 8,175 extension workers underwent training, with an additional 2,195 trained by November 2024. In addition to training programs, the government operates the Kisan Call Centre to address farmers' queries regarding agriculture and allied sectors. Responses to these queries are provided in 22 official languages from 17 locations nationwide.

## **IMPROVEMENT IN AGRICULTURE MARKETING INFRASTRUCTURE**

9.32 The government has started several programs to encourage private investment in agricultural marketing infrastructure. One such initiative is the Agriculture Marketing Infrastructure (AMI) sub-scheme, introduced in 2014. It provides capital subsidies to individuals, farmers, and cooperatives to develop storage infrastructure. The AMI is a capital investment program that is open-ended, demand-driven, credit-linked, and features a back-ended subsidy mechanism.

9.33 Under this sub-scheme, a subsidy of 25 per cent is granted for projects in the plains, while projects in the North-Eastern, hilly, and other specified regions, as well as those led by women, SC/ST promoters, and FPOs, can receive a subsidy of 33.33 per cent. The subsidies support the establishment of a range of agricultural marketing infrastructure projects, including storage facilities, rural haats, common facilitation centres for FPOs, market yard infrastructure, direct marketing facilities, mobile post-harvest<sup>29</sup> operations, cold storage facilities, and integrated value chain projects up to the primary processing stage.

<sup>29</sup> Mobile post-harvest systems are portable solutions for processing, storing, and handling agricultural produce near harvest sites to reduce losses and maintain quality.

9.34 As of October 31, 2024, 48611 storage infrastructure projects have been sanctioned, with ₹4,795.47 crore disbursed in subsidies. In addition, 21004 projects related to other types of infrastructure assisted under the AMI scheme have been sanctioned, amounting to a subsidy of ₹2,125.76 crore.

#### **BOX IX.5 : Empowering Farmers: The Success Story of MAHAFPC**

Maha Farmers Producer Company Limited (MAHAFPC), a state-level producer company in Maharashtra, has empowered 646 FPOs to procure and sell agricultural products, including pulses and perishable items. It has helped farmers by providing multiple procurement centres, reducing transportation costs, and ensuring timely payment at MSP. In 2022, MAHAFPC became Maharashtra's largest procurement channel, benefiting over 1.7 lakh farmers. The company has also assisted FPOs in developing infrastructure like storage facilities and processing units. By connecting FPOs with private players and using digital technology, MAHAFPC has created employment opportunities and strengthened the agricultural value chain<sup>30</sup>.

9.35 Another scheme is the Agriculture Infrastructure Fund (AIF) launched in 2020 to boost farm-gate infrastructure further and improve private sector involvement. This fund provides medium-term debt financing for post-harvest management and community farming projects, offering interest subvention and credit guarantees and supporting various projects such as custom hiring centres, processing units, warehouses, and cold storage facilities.

#### **BOX IX.6 : Innovative Ways of Land Leasing – Case of Kerala**

The Model Agricultural Land Leasing Act, 2016, introduced by NITI Aayog, is a model law aimed at legalising and facilitating the leasing of agricultural land in India. The objective is to improve land access for landless and marginal farmers and provide them with various benefits and protections while safeguarding the rights and interests of landowners. The states of Andhra Pradesh and Odisha have attempted to introduce some forms of land leasing. However, the state government of Kerala has created an innovative arrangement for land leasing. Under this, women or men's SHG groups lease land for more than 3 years for horticulture cultivation. This agreement is made under the Indian Contract Act, 1872, in which the lessee offers agriculture as a service to the landlord and shares profits or pays fixed compensation. The Gram Panchayat (GP) becomes a party to the transaction, and the agreement is notarised in the GP. This helps the lessee group become eligible for benefits like credit and insurance. Since the agreement lasts 3 to 5 years, it is well-suited for cultivating horticulture crops. It also encourages the lessee to maintain and nurture the quality of the land, with findings indicating an increase in farm efficiency in terms of input-output ratio in the case of group leased land compared to owned and self-cultivated land and individually leased land in Kerala possibly due to better convergence achieved with central and state government support for group farming activities. The initiative has also improved land access for the poor, as more than 85 per cent of the members are under the low-income category.

9.36 To enhance efficiency in agricultural marketing and improve price discovery, the government has introduced the e-NAM Scheme. This initiative provides free software and financial assistance of ₹75 lakh per Agricultural Produce Market Committee (APMC) Mandi for essential hardware, which includes quality assaying equipment and the development of infrastructure for cleaning, grading, sorting, and packaging. Additionally, to support FPOs and empower farmers, the government launched a scheme in 2020 with a budget of ₹6,860 crore. As of October 31, 2024, over 1.78 crore farmers and 2.62 lakh traders have registered on the e-NAM portal. As of the same date, 9,204 FPOs have been registered, and 4,490 of these organisations have received equity grants amounting to ₹237 crore.

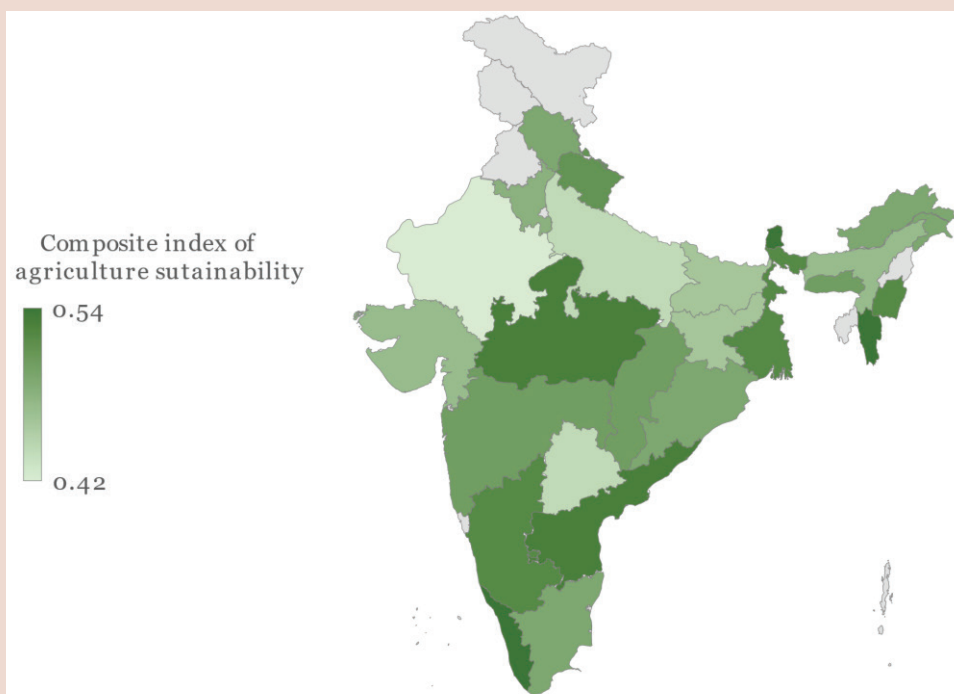
## CLIMATE ACTION IN AGRICULTURE

9.37 The NMSA is recognised as one of the nine missions within the National Action Plan on Climate Change (NAPCC). The NMSA has identified key climate adaptation strategies, including enhancing water efficiency, managing soil health and nutrients, providing crop insurance, offering credit support, strengthening value chains, delivering agro-advisories, promoting farm mechanisation, managing agricultural waste, developing integrated farming systems, and supporting organic and natural farming practices. It also emphasises climate-resilient varieties, livestock, and fish culture, promoting these initiatives through various government schemes.

9.38 To support organic farming, the government has implemented two dedicated schemes since 2015: the Paramparagat Krishi Vikas Yojana (PKVY) and the Mission Organic Value Chain Development for North Eastern Region (MOVCDNER). Under PKVY, 52,289 clusters covering 14.99 lakh hectares and 25.30 lakh farmers have been mobilised. Similarly, under MOVCDNER, 434 Farmer Producer Companies have been created, covering a total area of 1.73 lakh hectares and benefiting 2.19 lakh farmers.

### BOX IX.7 : Spatial mapping of agricultural sustainability

A Composite Index of Agricultural Sustainability was calculated by ICAR using 51 indicators related to environmental health, soil and water quality, and socioeconomic development. The average estimated value of the Index is 0.49, suggesting that Indian agriculture is moderately sustainable. States like Mizoram, Kerala, Madhya Pradesh, Andhra Pradesh, Manipur, West Bengal, and Uttarakhand perform better than the national average.

**Chart IX. 18: Composite index of agriculture sustainability-State wise**

Source: A Spatial Assessment of Sustainability in Indian Agriculture, Policy paper 42, 2024, ICAR

In contrast, arid Rajasthan has the least sustainable agricultural practices. According to the report, the states with higher sustainability scores have experienced sizable crop diversification, improvement in agriculture infrastructure, farm credit and sustainable input usage. States in the Indo-Gangetic Plains, including Uttar Pradesh, Punjab, Bihar, and Haryana, as well as rice-dominant states like Jharkhand and Assam, are at a higher risk of climate change impacts.

## **ALLIED SECTORS: Potential to Build Resilience**

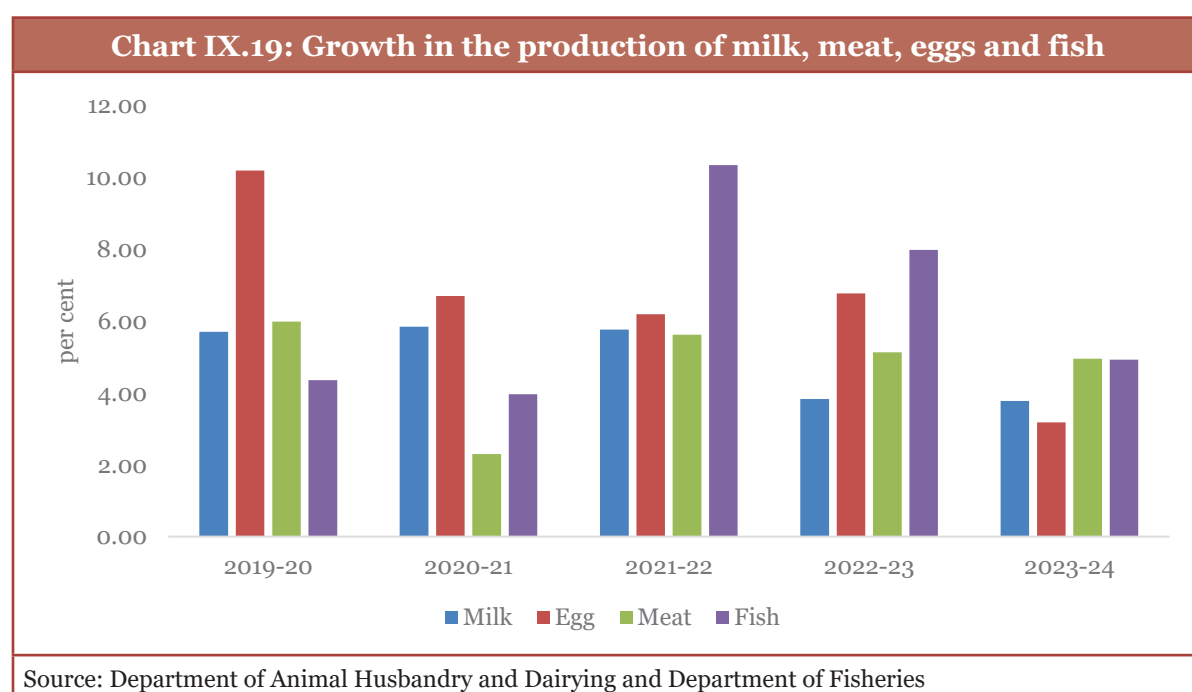
9.39 The livestock sector has emerged as a significant engine of growth in agriculture, playing a vital role in the overall agricultural landscape. This importance is underscored by a remarkable increase in its contribution to the Gross Value Added (GVA) of agriculture and related sectors, which surged from 24.38 per cent in the fiscal year FY15 to an impressive 30.23 per cent by FY23. In the latter year, the livestock sector alone represented 5.5 per cent of the total GVA, reflecting its dynamic growth trajectory, with a robust CAGR of 12.99 per cent.

9.40 The economic significance of this sector is clearly illustrated by its escalating output value, which reached an astounding 17.25 lakh crore rupees (equivalent to US\$205.81 billion) in FY23. Among the various branches of livestock production, the milk industry stands out, generating over ₹11.16 lakh crore (US\$133.16 billion) in revenue. This figure highlights the sector's vitality and reveals its dominance, eclipsing the aggregate production value of staple crops like paddy and wheat. The livestock



sector is thus not just a contributor to the economy; it is a cornerstone of agricultural prosperity and food security, propelling the rural economy and livelihoods along the way.

9.41 The government has supported the sector through various initiatives by recognising the growing importance of the livestock sector and its potential to boost farm incomes. The interventions include the Rashtriya Gokul Mission for the development and conservation of indigenous bovine breeds, the Livestock Health and Disease Control Program to enhance the well-being of livestock, the promotion of IVF technology and sex-sorted semen production to increase the productivity of female cows and initiatives to encourage the formation and growth of FPOs and SHGs to strengthen the sector. Further, the mechanism of Multipurpose AI Technicians in Rural India (MAITRIs) has been established to deliver breeding inputs to farmers' doorstep. In the last 4 years, 38736 MAITRIs have been inducted under Rashtriya Gokul Mission.



9.42 The government has implemented several initiatives to enhance the fisheries sector's production and productivity over the past decade. The Pradhan Mantri Matsya Sampada Yojana (PMMSY) was established to boost aquaculture productivity and improve fisheries management. Additionally, the Fisheries and Aquaculture Infrastructure Development Fund (FIDF) was introduced to provide financial support for developing infrastructure in both marine and inland fisheries. Other supportive measures include the establishment of fishing harbours and fish landing centres, the adoption of innovative production technologies such as cages<sup>31</sup>, Recirculating

<sup>31</sup> Cages are netted enclosures in water bodies like lakes or rivers, allowing water flow while containing fish.

Aquaculture Systems (RAS)<sup>32</sup>, bio flocs<sup>33</sup>, pens<sup>34</sup>, and raceways<sup>35</sup>, as well as initiatives focused on transforming waste into wealth through the expansion of saline water aquaculture, and the growth of freshwater fisheries, cold water fisheries, ornamental fisheries, and pearl cultivation. Significant investment has also been made in marketing and transportation infrastructure, along with the development of cold storage facilities.

9.43 Due to these initiatives, total fish production (both inland and marine) has surged to 184.02 lakh tonnes in FY 23, up from 95.79 lakh tonnes in FY14. Furthermore, India's seafood exports have risen from ₹46,662.85 crore in FY-20 to ₹60,523.89 crore in 2023-24, reflecting a growth of 29.70 per cent.

9.44 Under the Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PM-MKSSY), the National Fisheries Digital Platform (NFDP) was launched, successfully mobilising and registering 16.35 lakh fish producers, workers, vendors, and processors within a short timeframe of just four months.

### **COOPERATIVE SOCIETIES: Strengthening the Institution to serve better**

9.45 Cooperative societies in India serve a vital function across many sectors, including agriculture, credit and banking, housing, and women's welfare. These societies are essential in promoting financial inclusion, particularly by extending credit to farmers and small entrepreneurs who frequently encounter barriers when accessing conventional banking services.

9.46 To strengthen the cooperative sector, the Indian government has implemented various strategic initiatives. These include the introduction of Model Bye-Laws specifically for Primary Agricultural Credit Societies (PACS), designed to provide a structured framework for their operations. Additionally, the government has prioritised the computerisation of PACS to enhance efficiency and transparency. There is also an ongoing effort to establish new multipurpose PACS and dedicated dairy and fishery cooperatives, which serve diverse community needs. Another key focus is the transformation of PACS into Common Service Centres (CSCs), which are intended to provide services beyond financial assistance.

9.47 Other noteworthy measures aimed at enriching the cooperative landscape include the establishment of retail petrol and diesel outlets and the setting up of micro-ATMs within cooperative societies to facilitate easier access to banking services. Moreover, the issuance of RuPay Kisan Credit Cards specifically for dairy cooperatives aims to improve the financial capabilities of these entities and their members.

9.48 The achievements of these initiatives are significant. Over 9,000 new PACS, dairy, and fishery cooperatives in underserved panchayats have been established,

32 RAS uses tanks to grow fish while continuously filtering and reusing water.

33 Biofloc systems use microorganisms (bacteria, algae) to convert organic waste, uneaten feed, and excreta into protein-rich feed directly in the water.

34 Pens are netted enclosures in natural water bodies, restricting fish to a specific area while allowing water exchange.

35 Raceways are narrow channels with continuous one-way water flow, supplying oxygen and removing waste efficiently.

receiving support from various federations. As part of the government's push for greater accessibility, 240 PACS have applied for retail petrol and diesel outlets, with 39 currently selected to operate, thus expanding their service offerings. Furthermore, a substantial number—35,293 PACS—are now functioning as Pradhan Mantri Kisan Samridhhi Kendras (PMKSK), which are dedicated to providing essential fertilisers and related services to farmers, directly impacting agricultural productivity. Further, 1,723 micro-ATMs have been distributed, facilitating doorstep financial services and enhancing accessibility for rural populations.

## **FOOD PROCESSING INDUSTRIES: Critical for the Economy**

9.49 The food processing industry in India is one of the largest employers within organised manufacturing, accounting for 12.41 per cent of total employment in the organised sector. In the fiscal year FY24, the value of agri-food exports, which includes processed food exports, reached USD 46.44 billion, constituting roughly 11.7 per cent of India's total exports. Notably, the share of processed food exports within agri-food exports has risen from 14.9 per cent in FY18 to 23.4 per cent in FY24.

9.50 To foster growth in the food processing sector, the Indian government has initiated several key programs, including the Pradhan Mantri Kisan Sampada Yojana (PMKSY). This scheme focuses on developing modern infrastructure and optimising supply chains from farm to retail. By minimising post-harvest losses, increasing processing capabilities, and enhancing export levels, PMKSY aims to promote the overall advancement of the food processing industry. As of 31 October 2024, 1,079 PMKSY projects have been completed.

9.51 The Production Linked Incentive Scheme for Food Processing (PLISFPI), launched in 2021, seeks to cultivate globally competitive food processing leaders by facilitating branding and marketing initiatives in international markets. By 31 October 2024, 171 applications had been approved under this scheme, with beneficiaries investing ₹8,910 crore and receiving ₹1,084.01 crore in incentives.

9.52 Furthermore, to provide comprehensive support—including technical, financial, and business assistance for establishing or upgrading micro food processing enterprises—the Pradhan Mantri Formalisation of Micro Food Processing Enterprises (PMFME) scheme was launched in 2020. As of 31 October 2024, the scheme has received 407,819 applications, with loans totalling ₹8.63 thousand crore sanctioned to 108,580 applicants. Additionally, the programme has successfully trained 672 Master Trainers, 1,120 District Level Trainers, and 87,477 beneficiaries across 36 states and union territories.

## **FOOD MANAGEMENT: Enabling Food Security**

9.53 The basic concept of food security is to ensure that there is access to basic food for their active and healthy lives. It is characterised by the availability, access, utilisation, and stability of food supply. While the government has long tackled household food

security through the Public Distribution System (PDS) and Targeted PDS (TPDS), the National Food Security Act (NFSA) 2013 and the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) marked a fundamental shift in the approach to food security. That is transitioning from a welfare-based to a rights-based approach. NFSA act legally entitles up to 75 per cent of the rural population and up to 50 per cent of the urban population to receive foodgrain, free of cost, under the Targeted Public Distribution System, which, as per Census 2011, comes to 81.35 crore persons. Therefore, about two-thirds of the population is covered under the Act to receive highly subsidised food grains. In addition, PMGKAY was introduced to alleviate the suffering of the poor and vulnerable caused by the COVID-19 pandemic. The allocation of free food grain under PMGKAY is in addition to the regular allocation for around 80 crore beneficiaries. The provision of free food grains under PMGKAY for another five years, with effect from 1st January 2024, reflects the long-term commitment and vision of the Government for addressing National food and nutrition security.

9.54 To enhance the efficiency of the Public Distribution System (PDS), the government is fully committed to achieving 100 per cent e-KYC compliance nationwide. This aligns with the One Nation, One Ration Card (ONORC) scheme, allowing beneficiaries to complete electronic know your customer e-KYC anywhere, regardless of their home state. Beneficiaries can authenticate their Aadhaar biometrics at any Fair Price Shop (FPS), making it especially convenient for migrant workers to access their entitlements. To facilitate post-harvest lending for farmers, especially small and marginal farmers, the government has approved the Credit Guarantee Scheme for electronic-negotiable warehouse receipt (e-NWR)-based Pledge Financing (CGS-NPF). Under this scheme, farmers can obtain loans against e-NWRs issued for agricultural and horticultural commodities stored in accredited warehouses. The scheme covers the loss incurred by the bank due to credit and warehouseman risk. The scheme will help in increasing post-harvest lending against e-NWRs and thereby play a role in improving farmers' income.

#### **BOX IX.8 : Measures to support foodgrain storage infrastructure in the country**

- To support and upgrade the storage infrastructure for foodgrains and to ramp up the storage capacity in India, steel silos are being created in PPP.
- The government is creating capacity under Hub and Spoke Model Silos, where “Hub” silos have a dedicated railway siding and container depot facility. While the transportation from “Spoke” Silos to “Hub” Silos is undertaken by road, transportation from Hub to Hub is via rail.
- To improve food grain storage, especially in hilly and remote areas, the government is exploring the use of Flospan, a type of Mobile Storage Unit (MSU), in collaboration with the World Food Programme (WFP). These units can be quickly erected and have a storage capacity of 400 metric tonnes. As a pilot project, WFP has installed Flospan in six states: Jammu & Kashmir, Himachal Pradesh, Rajasthan, Mizoram, Uttarakhand, and Chhattisgarh.
- To modernise government grain warehouses, the government partnered with WFP and IGMRI to pilot a 'Smart Warehouse'. This warehouse uses sensors to monitor temperature, humidity, airflow, and rodent activity, providing real-time data to improve storage and reduce losses.

## CONCLUSION

9.55 India's agricultural sector, despite encountering various challenges, remains a crucial pillar for economic growth and ensuring food security for the nation. This sector has consistently demonstrated remarkable resilience, evidenced by stable growth rates supported by a range of government initiatives to enhance productivity, diversify crop portfolios, and provide essential social security support for farmers.

9.56 The increasing significance of allied sectors, such as animal husbandry, dairying, and fisheries, underscores the importance of diversification in activities and sources of income for boosting their income levels and building resilience. By tapping into these complementary sectors, farmers can create additional streams of revenue that can buffer them against the inherent volatility of traditional crop production.

9.57 However, the sector is not without its challenges. Issues like climate change and water scarcity present significant obstacles that require focused and targeted interventions. Promoting agricultural production patterns and practices that align with the specific agro-climatic conditions and natural resource availabilities of different regions across the country is vital. Investment in research and development, especially on climate-resistant varieties, improved agriculture practices, diversification to high-yield and climate-resilient crops, and micro-irrigation, can yield sustainable long-term benefits. The widespread adoption of digital technologies in agriculture will unlock further possibilities for enhancing productivity.

9.58 Improving price discovery and market efficiency is another critical aspect that necessitates attention. Strengthening market infrastructure is essential to facilitate this improvement. This can be achieved by effectively utilising the e-NAM, a platform for farmers to access broader markets. Furthermore, supporting the establishment and operational capabilities of FPOs and enabling cooperatives to play a more active and influential role in agricultural markets is paramount to fostering an inclusive market environment.

9.59 Government initiatives like PM-KISAN, which provides direct income support to farmers, and Pradhan Mantri Kisan Maandhan Yojna (PMKMY), which offers pension schemes for farmers, have successfully contributed to bolstering farmers' incomes and enhancing their social security safety nets. More than 11 crore farmers have been benefitted under PM-KISAN and 23.61 lakh farmers had enrolled under PMKMY as of 31st October 2024. In addition to these efforts, reforms such as e-KYC compliance under the ONORC initiative and credit guarantee schemes for e-NWR financing address systemic inefficiencies that have historically plagued the agricultural sector.

9.60 Moreover, there is a concerted focus on modernising food grain storage systems, particularly in remote and hilly areas, which reflects a strong commitment to improving the overall supply chain infrastructure.

9.61 While various initiatives have helped India's agriculture and allied services to grow under challenging circumstances, the good news is that there is still significant

untapped growth potential. The right set of policies across all levels of government can reduce the overproduction of cereals and address the underproduction of pulses and edible oil. For instance, India's farmers must be allowed to receive price signals from the market unimpeded, with separate mechanisms designed to take care of the cost-of-living impact on deserving households for specified durations. Two, they need to have market mechanisms to hedge their price risks. Three, they need the right policies that nudge them away from impairing their soil fertility with an unbalanced application of fertilisers and from producing already overproduced crops, which deplete India's water resources and use up electricity excessively. These policy shifts will help lift agricultural productivity in the economy by boosting land and labour productivity in the sector. Consistent and stable growth of agriculture at around 5 per cent, with a 20 per cent share of overall GVA in the economy, will contribute 1 per cent growth to GVA. Agriculture will then absorb surplus labour even as output per worker and output per hectare rise. Agro-based entrepreneurship will flourish even more than it already does. In the process, India will not only achieve food security for itself but will also enable it for other nations too. The possibilities are both exciting and limitless.

\*\*\*\*\*