I J C R M

International Journal of Contemporary Research In Multidisciplinary

Review Article

Agricultural Growth and Labour Dynamics in India

Dr. M. Dillip Anand [1*], Dr. M. Mahalakshmi [2]

[1] Assistant Professor, PG & Research Department of Economics, Presidency College (Autonomous), Chennai, Tamil Nadu, India

[2] Assistant Professor, Department of Economics, A.V.C. College (Autonomous), Mannampandal, Mayiladuthurai, Tamil Nadu, India

Corresponding Author: *Dr. M Dillip Anand

DOI: https://doi.org/10.5281/zenodo.17079738

Abstract

Agriculture remains the foundation of human survival worldwide, as it directly or indirectly supports every nation by meeting primary needs such as food, raw materials, and employment. In the context of the 21st-century Millennium Development Goals, the eradication of extreme poverty and hunger has been recognized as a global priority, and strengthening the agricultural sector is central to achieving this aim. Since India's independence, remarkable progress has been made in food grain output and agricultural employment, reflecting the sector's vital role in economic transformation. Globally, too, countries are focusing on enhancing agricultural production and productivity to sustain growth and stability. The performance of agriculture significantly influences overall economic development and generates ripple effects across other sectors. Despite its declining share in India's Gross Domestic Product (GDP), agriculture continues to be critical for employment and poverty alleviation. For instance, agriculture's contribution to national income fell from about 56.5% in 1950–51 to nearly 24% by 2001–02. However, the proportion of the workforce dependent on agriculture has not declined at the same pace. Census and employment data indicate that while 75.9% of workers were engaged in agriculture in 1961, the share reduced gradually to 63.8% in 1993–94 and 59.9% in 1999–2000, with the absolute number of workers still around 238 million. Recent estimates show that agriculture continues to employ over 41% of India's workforce as of 2020, according to World Bank statistics. Notably, during periods of broader economic disruption, agriculture has remained relatively resilient, often performing better than other sectors.

Manuscript Information

- **ISSN No:** 2583-7397
- **Received:** 19-01-2025
- **Accepted:** 16-02-2025
- **Published:** 27-02-2025
- **IJCRM:**4(1); 2025: 227-232

- **Plagiarism Checked:** Yes
- **Peer Review Process:** Yes

How to Cite this Article

Anand MD, Mahalakshmi M. Agricultural growth and labour dynamics in India. Int J Contemp Res Multidiscip. 2025;4(1):227-232.

Access this Article Online

www.multiarticlesjournal.com

KEYWORDS: Agriculture sector, Poverty and hunger, Economic development, Employment, National income, Agriculture Productivity

INTRODUCTION

Agriculture and allied activities continue to hold a central place in India's economy due to their vital role in employment generation, income creation, and ensuring national food security. However, the sector's contribution to national income has gradually declined, falling from 18.2 percent in 2014-15 to 16.5 percent in 2019-20. This decline reflects the natural course of structural transformation and economic development. To achieve the goal of doubling farmers' income, critical challenges such as limited access to institutional credit, inadequate irrigation, insufficient insurance coverage, and relatively low levels of farm mechanization must be addressed. Currently, the level of mechanization in India is around 40 percent, which is significantly lower compared to 60 percent in China and nearly

75 percent in Brazil. The livestock sector, which has grown at an average annual rate of about 8 percent in recent years, has emerged as a key contributor to income, employment, and nutritional security. Similarly, the food processing industry has recorded a steady annual growth rate of over 5 percent in the six years ending 2017-18. Its role in reducing post-harvest losses and expanding markets for farm products highlights the need for more targeted policy attention. Meanwhile, the implementation of the National Food Security Act (2013) increased the food subsidy bill from ₹113,171 crore in 2014-15 to ₹171,127 crore in 2018-19, raising the urgency of balancing food subsidy rationalization with food security for vulnerable groups. Globally, India is committed to the UN Sustainable Development Goals (SDGs), particularly the "Zero Hunger" goal, which emphasizes sustainable agriculture, higher productivity, and improved farmer income. Despite the setbacks caused by the COVID-19 pandemic, the agriculture sector in India has shown resilience, contributing 18.8 percent to the country's Gross Value Added (GVA) in 2021-22 with steady growth rates of 3.6 percent in 2020-21 and 3.9 percent in 2021-22. Future food demand poses significant challenges. With the global population projected to reach 9.7 billion by 2050, food demand is expected to increase by nearly 60 percent (FAO). Although India's per capita income has risen steadily, per capita demand for foodgrains has not shown proportional growth. Research by Radhakrishna and Ravi (1992) [34] and Radhakrishna and Murty (1997)[35] attributes this stagnation to shifting consumer preferences away from cereals toward fruits, vegetables, dairy, and poultry products. By 2050, non-grain crops and animal-based foods are expected to dominate consumption patterns (Amarasinghe et al., 2007). Understanding consumer behavior and demand systems is therefore crucial for designing effective development policies, ensuring nutritional security, and reforming subsidy structures, while maintaining a balance between food and non-food consumption in the long run

REVIEWS OF LITERATURE

Bhalla & Singh 2001[37] The study highlighted irrigation expansion and increased fertilizer use as critical drivers of higher agricultural yields in India. However, they cautioned that uneven access across regions created disparities in productivity. They emphasized that balanced input use and wider adoption of irrigation infrastructure are essential to sustain long-term growth.

Chand et al. 2012[38] This research underlined the productivity gap between actual farm output and potential levels. Small and fragmented landholdings, limited technology adoption, and resource constraints were identified as major causes. The authors suggested policy interventions aimed at land consolidation, resource-efficient technologies, and institutional support to narrow this persistent productivity gap.

Reddy 2014 Reddy examined rural disguised unemployment, where more workers are engaged in agriculture than required. He argued that this surplus labour reduced efficiency and masked underemployment. The study proposed shifting labour towards rural non-farm sectors such as services and small-scale industries to ensure balanced employment generation and improved productivity.

Birthal *et al.,* 2015 [31]. Their work emphasized the rising contribution of allied activities like dairying, poultry, and fisheries to rural employment and incomes. These sectors provide diversification opportunities, reduce dependence on crops, and offer resilience against agricultural shocks. The authors recommended targeted investments and infrastructure support to enhance allied sector productivity and sustainability.

Gulati & Saini 2016 [9] The authors analyzed the impact of Minimum Support Price (MSP) policies, showing that cereals benefitted more than pulses and oilseeds. While MSP helped stabilize cereal productivity, the neglect of other crops created imbalances. They urged reorientation of price and procurement policies to ensure crop diversification and nutritional security.

Narayanan 2018[32] Narayanan examined India's structural transformation and found agriculture lagging behind the services sector in productivity growth. The study stressed that while services expanded rapidly, agriculture remained stagnant, creating wide inter-sectoral gaps. The research highlighted the need for skill development and investment in agriculture to facilitate a balanced structural shift.

FAO 2019[33] FAO emphasized the growing importance of sustainable agricultural practices in the era of climate change. The report highlighted practices like organic farming, conservation tillage, and efficient water use to address soil degradation and resource depletion. It stressed that climate-resilient strategies are crucial for ensuring long-term agricultural productivity and livelihoods.

NITI Aayog 2021[36] The NITI Aayog report argued that doubling farmers' income requires both productivity enhancement and employment diversification. It stressed strengthening agricultural value chains, rural entrepreneurship, and technology adoption. The study further recommended policy shifts towards high-value crops, allied sectors, and non-farm rural enterprises for income stability and employment growth.

Kumar 2021 [8] Kumar studied trends in agricultural mechanization and found that India lags behind other emerging economies in machinery adoption. Limited mechanization was attributed to fragmented holdings and affordability constraints. The study concluded that affordable, small-scale mechanization solutions and institutional credit support are necessary to improve productivity and reduce labour dependence.

Singh & Sharma 2022 This study reviewed rural employment trends during the COVID-19 pandemic. It found a temporary reversal of labour migration, with many workers returning to agriculture. This increased short-term dependence on farm jobs but also exposed vulnerabilities. The authors emphasized long-term diversification and policy measures to reduce reliance on agriculture alone.

OBJECTIVES OF THE STUDY

1. To analyze the contribution of agriculture to GDP and employment in India.
2. To assess trends in agricultural productivity across major crops.

3. To examine challenges in rural employment and disguised unemployment.
4. To suggest policy measures for sustainable growth and employment generation.

Hypothesis of the study

1. Agricultural production and productivity significantly reduce poverty in India by improving rural income and food security.
2. Agriculture plays a vital role in generating employment opportunities, particularly in rural areas.

METHODOLOGY

The present study is based on secondary data collected from reliable government and institutional sources. The main data has been drawn from reports, publications, and statistics released by the Ministry of Agriculture and Farmers' Welfare, Government of India. In addition, data from agencies such as NITI Aayog, the Food and Agriculture Organization (FAO), and other relevant academic studies were also referred to. The analysis employs a descriptive and comparative approach to assess the relationship between agricultural productivity, poverty reduction, and employment generation. Wherever secondary data was available, it was systematically utilized to support the objectives of this article.

RESULTS AND DISCUSSION

Table 1: Growth of the Agriculture and Allied sectors from 2016-17 to 2021-22 (In Percentage)

Agriculture Years	Percent
2016-17	6.8
2017-18	6.6
2018-19	2.6
2019-20	4.3
2020-21	3.6
2021-22	3.9

Source: First Advance Estimation of National Income (2021-22)

Table 1 highlights the growth performance of the agriculture and allied sectors in India during the six years from 2016–17 to 2021–22. The data illustrates not only the fluctuations in agricultural growth but also reflects the structural challenges and resilience of the sector in the face of climatic variations, policy reforms, and external shocks. In 2016–17, the agriculture sector recorded a growth of 6.8%, which was one of the highest in recent years. This growth can be attributed to favorable monsoons, higher food grain production, and improved access to agricultural inputs such as seeds, fertilizers, and credit. It signaled a recovery after consecutive years of erratic rainfall. However, in 2017–18, growth slightly moderated to 6.6%, though still robust, indicating relative stability. This was a period when government support programs, including Minimum Support Price (MSP) increases and crop insurance schemes, played a positive role. The year 2018–19 witnessed a sharp decline to 2.6%, the lowest during the period under review. This slowdown was largely due to uneven rainfall distribution, stress in rural demand, and slower growth in allied activities. It reflected the structural vulnerability of Indian agriculture to climatic risks, particularly the heavy dependence on monsoon rainfall in rain-fed regions. The low productivity of pulses and oilseeds also contributed to this dip. A partial recovery was observed in 2019–20 with a growth of 4.3%, driven by better rabi crop output, increased horticulture production, and resilience in the livestock and fisheries sectors. This period also saw gradual improvements in irrigation infrastructure and mechanization in certain states, which cushioned the sector from greater volatility. The COVID-19 pandemic year, 2020–21, is particularly significant. While most sectors of the Indian economy contracted, agriculture managed to grow at 3.6%, showcasing its resilience and importance as a livelihood base for nearly half of the workforce. The relatively stable performance can be linked to continued operations of farming activities even during lockdowns, bumper harvests of rice and wheat, and sustained demand for essential food items. This reinforced agriculture's role as a "shock absorber" during crises. In 2021–22, growth slightly improved to 3.9%, reflecting a steady but moderate trajectory. Despite ongoing challenges such as rising input costs, climate-induced risks, and rural distress, allied activities such as dairy, poultry, and fisheries played a critical role in sustaining agricultural income. Moreover, diversification into horticulture and the adoption of digital technologies in farming practices provided some momentum. Overall, the trend from 2016–17 to 2021–22 shows that agricultural growth in India remains volatile and heavily dependent on monsoon patterns and policy interventions. While the sector has shown resilience, especially during the pandemic, the relatively modest growth rates after 2017 suggest the need for structural reforms. Enhancing irrigation coverage, promoting crop diversification, reducing dependence on cereals, strengthening value chains, and improving market access are crucial for sustaining higher and inclusive growth. Without these measures, agriculture may continue to struggle with low productivity and disguised unemployment, even while remaining central to food security and rural livelihoods.

Table 2: Year-wise (2017to 2022) status of food grain production in India (In million tonnes)

Year	Food grain production (In million tonnes)
2017-18	285.01
2018-19	285.21
2019-20	297.5
2020-21	310.74
2021-22*	314.51

Source: Ministry of Agriculture, Government of India (2022)

The food grain production in India between 2017–18 and 2021–22 demonstrates a clear pattern of gradual growth, reflecting the resilience of Indian agriculture despite various economic, social, and environmental challenges. The data indicates that production increased from 285.01 million tonnes in 2017–18 to 314.51 million tonnes in 2021–22, registering a net increase of nearly 29.5 million tonnes within five years. This upward trend is a positive indicator of India's food security, agricultural

modernization, and the contribution of the sector to the national economy. In 2017–18, food grain production stood at 285.01 million tonnes, which was almost stagnant in 2018–19 at 285.21 million tonnes.

The negligible growth of 0.20 million tonnes during this period highlights a phase of stagnation, possibly due to erratic monsoons, soil fertility issues, or challenges in the distribution of agricultural inputs such as seeds, fertilizers, and irrigation facilities. However, the scenario improved in the following years. In 2019–20, food grain output rose significantly to 297.50 million tonnes, marking an increase of over 12 million tonnes compared to the previous year. This improvement could be attributed to better monsoon conditions, enhanced mechanization, government schemes promoting higher productivity, and growing adoption of high-yielding seed varieties. Importantly, this period also witnessed policy support from the Government of India through programs like the Pradhan Mantri Fasal Bima Yojana (PMFBY) and the push for better irrigation coverage under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), which encouraged farmers to expand production. The growth momentum continued into 2020–21, with production reaching 310.74 million tonnes, a substantial increase of 13.24 million tonnes compared to 2019–20. This achievement is particularly noteworthy as it came during the COVID-19 pandemic, which disrupted supply chains, labor availability, and input delivery systems. Despite such challenges, agriculture remained the backbone of the economy during this crisis, ensuring food availability and acting as a stabilizing force for employment and income in rural areas. The resilience of farmers and strong government procurement policies, especially for rice and wheat under the Minimum Support Price (MSP) system, played a critical role in sustaining this growth. In 2021–22, food grain production rose further to 314.51 million tonnes, achieving the highest level in the five years. This increase demonstrates not only the sector's ability to expand production but also its adaptability to climate and market conditions. Enhanced technological adoption, such as the use of digital platforms for input access, precision farming practices, and greater mechanization, likely contributed to this progress. Furthermore, diversification in crop patterns and rising public investment in infrastructure such as storage, cold chains, and logistics improved overall efficiency in the agricultural value chain. Overall, the five-year trend from 2017–18 to 2021–22 reflects a consistent upward trajectory in India's food grain production, except for the stagnation observed in 2018–19. The compound growth rate underscores the increasing capability of Indian agriculture to meet the food requirements of its growing population.

However, the data also highlights the need for sustainable farming practices, better climate resilience strategies, and continued policy support to ensure long-term growth. The rising production levels demonstrate that agriculture in India is gradually shifting from subsistence-oriented farming to a more productive and technology-driven model.

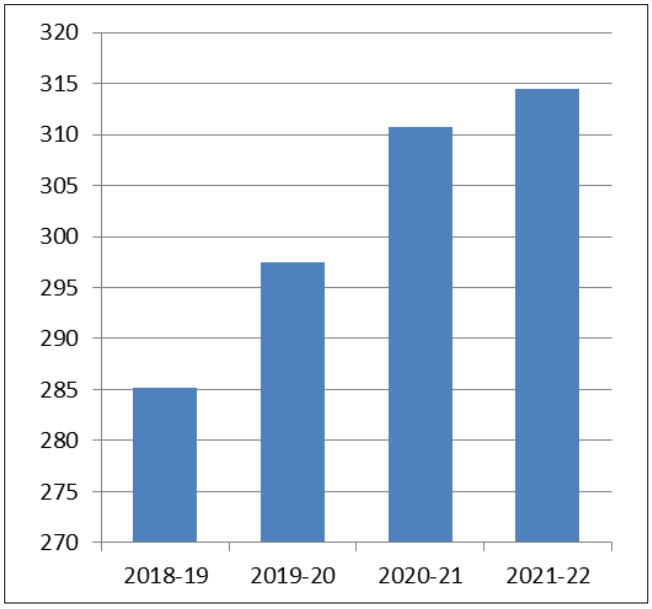

Fig 1.1: Trend of Food grain Production in India (2018–19 to 2021–22)

Table 3: Crop wise Food grain production in 2021-22 (In million tones)

Crops	2021-22 (Million Tonnes)	2020-21 (Million Tonnes)	Percentage Change (%)
Foodgrains	316.06	310.74	1.71
Wheat	111.32	109.50	1.58
Rice	127.93	124.30	2.86
Mustard	11.49	10.21	12.54
Gram	13.12	11.91	10.16
All Pulses	26.96	25.49	5.77
All oilseeds	37.14	35.94	3.34
Cotton*	34.06	35.24	-3.35
Sugarcane	414.04	405.39	2.13

(*In million bales, bale$_{=170Kgs.}$)
Source: Second advanced estimates of Foodgrains.

Table 3 explains that the agricultural sector in India continues to play a pivotal role in ensuring food security and sustaining rural livelihoods. The data from the Second Advance Estimates of Food Grains for 2021–22 highlights the production performance of major food crops, pulses, oilseeds, and commercial crops such as cotton and sugarcane. An overall production growth is evident, though variations exist across individual crops, indicating sectoral strengths and challenges. India's total foodgrain output in 2021–22 reached 316.06 million tonnes, compared to 310.74 million tonnes in 2020–21, marking a growth of 1.71%. This reflects steady progress in agricultural performance, aided by favorable monsoon patterns, government support programs, and the use of improved seed varieties and mechanization. Such growth is vital for addressing the needs of a growing population and strengthening buffer stocks under the Public Distribution System (PDS). Among cereals, wheat production rose to 111.32 million tonnes, an increase of 1.58% over the previous year. This reflects sustained productivity improvements and wider adoption of high-yielding varieties. Rice production showed a stronger growth trajectory, climbing from 124.30 million tonnes in 2020–21 to 127.93 million tonnes

in 2021–22, recording a 2.86% increase. As rice remains a staple food across much of India, such expansion has direct implications for food security and rural income stability. Pulses, crucial for nutritional security due to their protein content, registered impressive growth. Gram production rose by 10.16%, reaching 13.12 million tonnes compared to 11.91 million tonnes the previous year. The broader category of all pulses also expanded to 26.96 million tonnes, reflecting a 5.77% growth. This increase is significant given India's reliance on pulse imports in the past; higher domestic production indicates progress toward self-sufficiency and reduced dependence on international markets. Oilseed production also improved, with all oilseeds reaching 37.14 million tonnes, up by 3.34%. Notably, mustard production witnessed a sharp rise of 12.54%, from 10.21 million tonnes in 2020–21 to 11.49 million tonnes in 2021–22. This growth reflects favorable climatic conditions and an expansion in mustard cultivation, partly driven by government incentives for oilseed production under the National Mission on Edible Oils. The increase in mustard is particularly relevant given India's high edible oil import bill; boosting domestic oilseed output helps reduce external dependency. Commercial crops display a mixed performance. Cotton production, measured in bales (1 bale = 170 kg), fell from 35.24 million bales in 2020–21 to 34.06 million bales in 2021–22, reflecting a 3.35% decline. This decline could be attributed to pest attacks, erratic rainfall in certain regions, and fluctuating market prices that discouraged farmers. On the other hand, sugarcane production increased from 405.39 million tonnes to 414.04 million tonnes, marking a growth of 2.13%. Sugarcane's strong performance can be linked to stable demand from sugar mills and the government's ethanol-blending program, which has provided farmers with assured markets.

CONCLUSION AND SUGGESTIONS

The agriculture and allied sectors demonstrated strong resilience during the COVID-19 crisis. While the economy as a whole was affected, agriculture continued to grow, registering 3.6% growth in 2020–21 and slightly improving to 3.9% in 2021–22. Despite this stability, the recent SAS report highlights that shrinking landholdings have compelled rural households to depend increasingly on supplementary activities such as livestock rearing, fisheries, and wage employment. The growing contribution of allied activities—including dairying, animal husbandry, and aquaculture—signals the urgent need to place greater emphasis on these areas for enhancing farm incomes and overall sectoral growth. Enhancing the productivity of small and marginal farmers must be a priority. This can be achieved through the development and dissemination of technologies tailored for small holdings. Simultaneously, crop diversification should be promoted, especially toward pulses, oilseeds, and horticulture, which not only enhance nutrition but also use water more efficiently compared to traditional crops like rice and wheat. Addressing the underlying challenges of irrigation, credit access, investment, and market linkages is essential to facilitate such diversification. Although the Minimum Support Price (MSP) policy has been used to guide farmers toward alternative crops, achieving sustainable diversification requires stronger collaboration between the central and state governments. Research and Development (R&D) is another crucial lever for sustainable agricultural progress. Studies show that every rupee spent on agricultural research generates significantly higher returns compared to subsidies and input support. Hence, increased funding for agricultural R&D could lead to substantial improvements in crop yields, efficiency, and farmers' incomes. Moreover, promoting alternative fertilizers such as Nano Urea and organic options would help protect soil fertility, enhance nutrient efficiency, and reduce the excessive use of chemical inputs. New technologies, including drones, artificial intelligence (AI)-based decision-making tools, and low-cost organic solutions, should be promoted, while start-ups working on innovative agricultural practices need support to scale their ideas. At a broader level, India continues to face a disconnect between output growth and employment generation. The non-agricultural sectors have expanded but without creating sufficient job opportunities to absorb the growing workforce. Rising levels of education, literacy, and vocational training have raised aspirations for better-paying, secure, and decent jobs. However, job creation in these categories has not kept pace with demand. The strong preference for government employment, due to its job security and associated benefits, has further intensified this mismatch. This imbalance directly affects labour markets, the nature of employment, and workforce distribution, thereby calling for robust policies for employment generation. Finally, ensuring timely credit facilities at affordable interest rates remains essential to free farmers from dependence on informal moneylenders. Farmers should also be guided in the adoption of modern technologies, and quality inputs such as seeds and fertilizers must be supplied at controlled prices and on time. Cooperative systems can play a critical role in ensuring access to technology and inputs, particularly for smallholders. If such measures are implemented effectively, agricultural productivity can rise substantially, ensuring sustainable growth for both the sector and the rural economy.

REFERENCES

1. Government of India. Second Advance Estimates of Foodgrains 2021–22. Ministry of Agriculture and Farmers' Welfare, New Delhi; 2022.
2. Directorate of Economics and Statistics. Agricultural Statistics at a Glance 2021. Ministry of Agriculture, New Delhi; 2021.
3. Chand R. Doubling Farmers' Income: Rationale, Strategy, Prospects and Action Plan. NITI Aayog, New Delhi; 2019.
4. Birthal PS, Joshi PK, Gulati A. Agricultural diversification in India: Trends, constraints and policy implications. Economic and Political Weekly. 2021;56(4):1–12.
5. Reddy AA. Agricultural productivity growth in India: Role of technology and structural transformation. Indian Journal of Agricultural Economics. 2020;75(2):145–160.
6. Food and Agriculture Organization (FAO). FAOSTAT Database. FAO, Rome; 2020.

7. World Bank. World Development Indicators: Agriculture and Rural Development. Washington, DC; 2021.
8. Kumar P, Mittal S. Agricultural productivity trends in India: Sustainability concerns. Indian Journal of Agricultural Sciences. 2021;91(7):873–880.
9. Gulati A, Juneja R. Agriculture diagnostics for India. ICRIER Working Paper, New Delhi; 2019.
10. Narayanan S. Employment in Indian agriculture: Emerging trends. Economic and Political Weekly. 2020;55(17):24–30.
11. Planning Commission of India. Twelfth Five-Year Plan: Agriculture and Rural Development. Government of India, New Delhi; 2013.
12. National Sample Survey Office (NSSO). Situation Assessment of Agricultural Households. Ministry of Statistics, New Delhi; 2019.
13. Sen A, Bhatia MS. Agricultural Statistics System in India. Academic Foundation, New Delhi; 2019.
14. Sharma VP. Price policy and its impact on agricultural production and employment. Indian Journal of Agricultural Economics. 2020;75(3):251–268.
15. Rao CHH. Agricultural Growth, Rural Poverty and Environmental Degradation in India. Oxford University Press, New Delhi; 2019.
16. NITI Aayog. Strategy for New India @ 75. Government of India, New Delhi; 2021.
17. Indian Council of Agricultural Research (ICAR). Annual Report 2019–20. ICAR, New Delhi; 2020.
18. Bhalla GS, Singh G. Indian Agriculture: Four Decades of Development. Sage Publications, New Delhi; 2021.
19. Swaminathan MS. Agricultural Development and Food Security in India. Academic Press, Chennai; 2018.
20. World Bank. Transforming Agriculture in South Asia: Productivity, Employment and Sustainability. Washington, DC; 2019.
21. National Bank for Agriculture and Rural Development (NABARD). Rural Pulse Report. NABARD, Mumbai; 2021.
22. Chand R, Pandey LM. Fertilizer use and agricultural productivity in India. Economic Affairs. 2020;65(1):11–20.
23. Desai BM. Rural Economy of India. Himalaya Publishing House, Mumbai; 2019.
24. Reserve Bank of India (RBI). Report on Currency and Finance: Agriculture and Rural Economy. RBI, Mumbai; 2020.
25. OECD–FAO. Agricultural Outlook 2021–2030. OECD Publishing, Paris; 2021.
26. Ministry of Rural Development. Annual Report 2019–20. Government of India, New Delhi; 2020.
27. Indian Council for Research on International Economic Relations (ICRIER). Policy Papers on Agriculture. New Delhi; 2021.
28. Datt G, Sundaram A. Indian Economy. S. Chand Publishing, New Delhi; 2020.
29. Saxena NC. Hunger, Food Security and Right to Food in India. Sage Publications, New Delhi; 2018.
30. Singh S, Kaur J. Agriculture and employment linkages in rural India. Journal of Rural Development. 2021;40(2):157–170.
31. Birthal PS, Negi DS, Khan MT, Aggarwal S. Is Indian agriculture becoming resilient to droughts? Evidence from rice production systems. Food Policy. 2015;56:1–12.
32. Vijayabaskar M, Narayanan S, Srinivasan S. Agricultural revival and reaping the youth dividend. Economic and Political Weekly. 2018;53(26–27):8–16.
33. Food and Agriculture Organization of the United Nations (FAO). *The State of Food and Agriculture 2019: Moving forward on food loss and waste reduction.* Rome: FAO; 2019.
34. Radhakrishna R, Ravi C. Effects of Growth, Relative Price and Preference on Food and Nutrition. Indian Economic Review. 1992;27:303–323.
35. Radhakrishna R, Murty KN. Econometrics of complete demand systems with illustrations for India. In: Krishna KL, editor. *Econometric Applications in India.* New Delhi: Oxford University Press; 1997. p.147–237.
36. NITI Aayog. *Annual Report 2020–21.* New Delhi: NITI Aayog; 2021.
37. Bhalla GS, Singh G, editors. *Indian Agriculture: Four Decades of Development.* New Delhi: SAGE Publications; 2001.
38. Chand R, Kumar P, Kumar S. Total factor productivity and returns to public investment on agricultural research in India. Agricultural Economics Research Review. 2012;25:181–194.