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Agriculture in India

Issues & Priorities

AGRI BULLETIN

AGRICULTURE COST MANAGEMENT BOARD

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICMAI)

Statutory Body under an Act of Parliament

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The Institute of Cost Accountants of India (ICMAI)- formerly known as the Institute of Cost and Works Accountants of India (ICWAI) is set up by an Act of Parliament (viz. Cost and Works Accountants Act, 1959) to develop and regulate the profession of Cost Accountancy in the country and is under the administrative control of the Ministry of Corporate Affairs, Government of India. The Institute is the 2nd largest Cost & Management Accounting body in the world and the largest in Asia. The Institute is a founding member of the International Federation of Accountants (IFAC), the Confederation of Asian & Pacific Accountants (CAPA) and the South Asian Federation of Accountants (SAFA). Presently, the Institute has about 1 Lakh members both in employment and practice and more than 5 Lakhs students on its rolls.

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"The Institute of Cost Accountants of India would be the preferred source of resources and professionals for the financial leadership of enterprises globally."

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Behind every successful business decision, there is always a CMA

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From the President's Desk

It is with great pride and enthusiasm that we present to you the latest edition of our Agri Bulletin "Agriculture in India: Issues and Priorities". This publication serves as a testament to the incredible strides we are making in the agricultural sector, which continues to be the backbone of our nation's economy. India is expected to achieve a record foodgrain production of 164.7 million tonnes in 2025. The government is focusing on strengthening Farmer Producer Organizations (FPOs) and implementing schemes like the Pradhan Mantri Dhan-Dhaanya Krishi Yojana to uplift low-productivity districts.

Our farmers, researchers, agricultural professionals and CMA professionals work tirelessly to enhance productivity, sustainability, decision making process and innovation in this field. Through this bulletin, we aim to share the most recent developments, research findings, and best practices that are shaping the future of agriculture.

In these challenging times, it is more important than ever that we come together to support our agricultural community and promote sustainable practices that will ensure the well-being of our environment and future generations. The contributions of each individual in the agricultural sector have never been more vital, and this publication stands as a tribute to their hard work and dedication.

As we look forward to a prosperous future, let us continue to collaborate, innovate, and push the boundaries of what is possible in agriculture. CMA professionals, researchers, farmers and agriculture professionals together, we can create a resilient, sustainable, and thriving agricultural landscape that will benefit our country and the world.

I congratulate and appreciate CMA Chittaranjan Chattopadhyay, Chairman of Agriculture Cost Management Board and all members of the board, all the authors for their tireless efforts towards improving the agriculture sector and successful publication of this Agri Bulletin.

Happy reading…….

CMA Bibhuti Bhusan Nayak
President, ICMAI

CMA Bibhuti Bhusan Nayak
President
The Institute of Cost Accountants of India

From the Vice-President's Desk

CMA T C A Srinivasa Prasad
Vice President
The Institute of Cost Accountants of India

It gives me immense pleasure to note that the Agriculture Cost Management Board of the Institute is publishing the 'Agri Bulletin' titled "Agriculture in India: Issues and Priorities". As we move forward in an era where agriculture continues to be the backbone of our economy, the agriculture sector is a primary source of income and employment for a large segment of the Indian population, with estimates suggesting it supports around 46% of the population. So it is essential that we keep ourselves informed, adapt to new technologies, and continue fostering sustainable practices that benefit our communities and environment.

Agriculture continues to evolve rapidly, driven by innovations that promise to shape the future of food production, land use, and rural development. In this edition, we have curated a collection of informative articles that provide an in-depth look at the Indian Agriculture Act, 2020, Feminization of Indian Agriculture, Farmer Suicides in India, Animal Husbandry in India etc. making an impact across the agricultural sector. From advanced farming techniques and climate-smart practices to updates on market trends and policy developments, we aim to deliver valuable and actionable insights that will empower you to make informed decisions, overcome challenges, and harness opportunities for growth and sustainability.

By staying connected and sharing knowledge, we can collectively ensure a thriving and resilient future for agriculture in India. Let us continue to work hand in hand to not only overcome the challenges of today but to build a thriving, sustainable, and resilient agricultural sector for tomorrow. Together, we can create an agriculture ecosystem that benefits all stakeholders and leaves a lasting positive impact on our economy, environment, and society.

We invite you to dive into the articles, engage in the conversations, and share your thoughts with us as we continue this journey together. Respectful thanks to all farmers, CMAs, and government for unwavering dedication to advancing the agricultural industry.

Jai hind……

CMA T C A Srinivasa Prasad
Vice President, ICMAI

From the Chairman's Desk

CMA Chittaranjan Chattopadhyay
Chairman
Agriculture Cost Management Board

The Agriculture Cost Management Board (ACMB) of the Institute of Cost Accountants of India (ICMAI) is pleased to release this Agri Bulletin, "**Agriculture in India: Issues and Priorities**." As we continue to witness rapid advancements in agricultural practices, it is crucial that we remain informed and adaptable to these changes. The Government of India has significantly supported this sector through increasing budget allocations, farmer-centric schemes, infrastructure development and promoting agricultural mechanization, aiming to boost productivity, enhance farmer incomes, and ensure food security. India's agriculture sector is a vital part of the Indian economy, employing millions of people and contributing to food security. The agriculture and allied activities sector contributed about 16% to India's GDP in the financial year 2024. This sector also supports about 46% of the population.

This Agri Bulletin on "Agriculture in India: Issues and Priorities" presents a new prototype for analyzing the issues in the agriculture sector and intends to provide some inputs for those which are directly and indirectly involved in policy formulation. "**Animal Husbandry in India: Contemporary Scenario for Transformative Initiatives**" is an article jointly written by Dr. K. Anbumani and Dr. D. Raja Jebasingh. This article explores India's animal husbandry sector, which is one of the largest in the world. It includes dairy, poultry, piggery, fish farming, etc. In addition to supplying milk, eggs, meat, wool, and hides, animals are major companions in farm work and rural transportation. India's livestock sector continues to be a pillar of strength for the economy, ensuring food security and providing sustainable livelihoods and critical support to millions of families across the country.

"**2020 Indian Agriculture Act: An Initiative Fulfilling the Unfinished Agenda of 1991 Reforms**," authored by Dr. R. Muthu Meenal, narrates the context and significant reasons for undertaking these policy reforms. It optimistically explores how the implementation of these acts could have benefited the farmers and the agriculture sector in the country. It also addresses the concerns raised by farmers' leaders and critics.

"**Future of Indian Agriculture: Challenges and Priorities**," contributed by CMA Parimal Ray, addresses the worrying issue of farmer suicides, which still remains a significant challenge needs immediate action. Major concerns include the poverty among Indian farmers and its severe consequences, such as tragic outcomes; the declining share of agriculture in India's national GDP; and the inadequate opportunities available for women in this sector.

"**Indian Agriculture at Crossroads: Strategies for Sustainable Growth and Prosperity**," written by Ar. Shyam Borawake, points out the failures of current agricultural policies, highlighting short-term political focus, inefficient pricing mechanisms, bureaucratic inefficiencies, and limited access to resources. It also emphasizes the importance of environmental sustainability and inadequate infrastructure for agricultural development.

"**Feminization of Agriculture in India**," contributed jointly by Prof. Swati Raju and Prof. Anuradha Patnaik, explores an important dimension of agriculture in India—the growing feminization of agriculture. The root of this shift lies in the changing labour markets that pull men out of agriculture, thereby increasing the role of women.

"**Trends and Patterns in Agricultural Credit: A Study on Utilization of Credit by Marginal Farmers in Nadia District of West Bengal**," jointly written by Ms. Mohima Basu, Mr. Dhruba Chatterjee, and Prof. (CS) Subrata Kumar Ray pointed the utilization of agricultural credit by marginal farmers in Nadia District, West Bengal. With focus on understanding the trends and patterns in credit access, usage, and its impact on agricultural productivity and livelihoods, as well as the key challenges faced by farmers, including access to credit, high-interest rates, insufficient documentation, and the dominance of informal lending.

"**The Role of NABARD in Village Development**," written by CMA Jyotsna Rajpal, states the crucial role of the National Bank for Agriculture and Rural Development (NABARD) in fostering rural development across India, with a particular emphasis on its impact on village development. India's villages, home to 68% of the population, benefit significantly from NABARD's initiatives.

"**Agriculture in India: Issues and Priorities**," written by Dr. R. S. Deshpande, analyzes concerns raised by policymakers who have let the population down. It provides a historical analysis with empirical evidence to illuminate the agricultural sector's journey through seven growth phases and concludes that, as no long-term policy has been envisioned or established, we must seriously consider a sustainable long-term solution.

The Board's aim is to foster a deeper understanding of the challenges and opportunities that exist within our agricultural sector in India and to inspire continuous learning and growth. This Agri Bulletin is not just a compilation of articles but a valuable asset to readers. Our agriculture sector faces numerous challenges, including small and fragmented land holdings, lack of irrigation, climate change impacts, inadequate infrastructure, and difficulties in accessing credit and markets, all contributing to low productivity and income. Our Agriculture Cost Management Board, CMAs, Agri professionals and all, by dedicatedly addressing these issues and by contributing in this Agri Bulletin.

I am very confident that this Agri Bulletin will serve as a valuable resource for readers and provide a better understanding of the importance of empowering farmers and promoting sustainable agricultural practices. I am deeply thankful to all the members of the Agriculture Cost Management Board for their relentless suggestions towards the development in functioning of the Board. I also express my gratitude to all CMAs and authors who have contributed to this edition.

CMA Chittaranjan Chattopadhyay

Chairman, Agriculture Cost Management Board, ICMAI

Animal Husbandry in India: Contemporary Scenario for Transformative Initiatives

Abstract

India's animal husbandry sector is one of the largest in the world. It is critical in strengthening the rural economy by providing food, employment, and livelihood. Livestock rearing is a major source of income for many rural households in India and India ranks 1st in milk, 2nd in egg, and 5th in meat production in the world. The DAHD is responsible for the promotion, protection, and animal health. This article explores how the Schemes of DAHD and sub-missions of the National Livestock Mission promote entrepreneurship and animal husbandry in India.

Key Words: Animal Husbandry, Livestock, Dairy, Disease Control

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Animal Husbandry

India's animal husbandry sector is one of the largest in the world. It is critical in strengthening the rural economy by providing food, employment, and livelihood. It includes dairy, poultry, piggery, fish farming etc. In addition to supplying milk, eggs, meat, wool, hide, etc., animals are the major companions in farm work and rural transportation. The livestock sector has grown at a Compound Annual Growth Rate of 12.99% between 2014-15 and 2022-23. The contribution of livestock in total agriculture and allied sector Gross Value Added has increased from 24.38% in 2014-15 to 30.23% in 2022-23 at current prices.

Objective of the study

The primary objective of this article is to study various transformative initiatives taken to significantly grow Animal Husbandry in India.

Research Methodology

The study is predominantly qualitative and exploratory. Secondary data sources served as the foundation for this article. The necessary data was gathered from the official reports and policy documents from the Department of Animal Husbandry and Dairying (DAHD), Ministry of Fisheries, Animal Husbandry and Dairying, Government of India, the Press Information Bureau, and other sources such as journals, and online e-resources.

Livestock Census in India

The livestock census in India started in 1919. It is a quinquennial exercise conducted once every 5 years. The 21st livestock Census is being conducted between October 2024 and February 2025. It covers all domesticated animals and its headcounts for 16 Species (219 Breeds) of animals possessed by households, household enterprises, non-household enterprises, and institutions at their site. It is a critical tool for gathering comprehensive data on the livestock population (species, breed, age, sex, and ownership) across India. Its objectives are multifaceted, aimed at facilitating proper planning, formulation, implementation, and monitoring of programs meant to improve the livestock sector in India.

Glimpses of the 21st Livestock Census

According to the 21st Livestock Census 2024 document 1, the total livestock population in India was 536.76 million, which marked an increase of 4.8% over the Livestock Census 2012. The total livestock population in rural and urban areas was 514.11 million (95.78%) and 22.65 million (4.22%), respectively, which marked an increase of 4.56% and 11.19% of the total livestock population compared to the previous census.

No	Species	Breeds	No	Species	Breeds
1	Cattle	53	9	Dog	3
2	Buffalo	20	10	Chicken	20
3	Sheep	45	11	Duck	3
4	Goat	39	12	Geese	1
5	Horse/Ponies	8	13	Yak	1
6	Donkey	3	14	Mithun	-
7	Camel	9	15	Rabbit	-
8	Pig	14	16	Mule	-
Total Breeds					**219**
Source: 21st Livestock Census					

There was a decline of 6 % in the total indigenous cattle population over the previous census. However, the pace of decline during 2012-2019 was much less as compared to 2007-2012 which was around 9%. The total number of livestock population in the country during 2019 along with percentile increase or decrease over the previous census period is given below[1];

- Bovine Population : 303.76 million in 2019 (1.3% increase).
- Cattle : 193.46 million in 2019 (1.3% increase).

- Buffaloes : 109.85 million in 2019 (1.1% increase).
- Goat : 148.88 million in 2019 (10.1% increase).
- Sheep : 74.26 million in 2019 (14.1% increase).
- Pigs : 9.06 million in 2019 (12.03% decrease).
- Horses and Ponies : 3.4 Lakhs in 2019 (45.2% decrease).
- Mules : 84000 in 2019 (57.1% decrease).
- Donkeys : 1.2 Lakhs in 2019 (61.2% decrease).
- Camel : 2.5 Lakhs in 2019 (37.1% decrease).
- Poultry : 851.81 million in 2019 (16.8% increase).
- Backyard Poultry : 317.07 million in 2019 (45.8% increase).
- Commercial Poultry : 534.74 million in 2019 (4.5% increase).

Importance of Livestock Protection for Attaining the SDGs

The livestock census data is being used to attain the Sustainable Development Goals adopted by the United Nations as follows[1];

Goal 2: Zero Hunger

Target 2.5: To maintain genetic diversity in food production by 2020.

Indicator 2.5.2: The percentage of local livestock breeds that are at risk of existence.

Growth in Livestock Production

Livestock rearing is a major source of income for many rural households in India. Livestock products like meat, milk, and eggs are rich in nutrients and help fight malnutrition. According to the Food and Agriculture

Organization's Corporate Statistical Database 2022, India ranks 1st in milk, 2nd in egg, and 5th in meat production in the world 2.

- India is ranked first in milk production contributing 24.76% of global milk production, growing at a CAGR of 5.62% over the past 10 years. The per capita availability of milk is estimated to be 471 grams per day in India during 2023-24 as against the world average of 329 grams per day in 2023 (Food Outlook Nov.2024)[2].
- Egg production in the country has increased from 78.48 billion in 2014-15 to 142.77 billion numbers in 2023-24, growing at 6.87% CAGR over the past 10 years. The per capita availability has increased from 62 eggs per annum in 2014-15 to 103 eggs in 2023-24.
- Meat production in the country has increased from 6.69 million tonnes in 2014-15 to 10.25 million tonnes in 2023-24, growing at 4.85% CAGR over the past 10 years.

Department of Animal Husbandry and Dairying

The Department of Animal Husbandry and Dairying (DAHD) functioning under the Ministry of Fisheries Animal Husbandry and Dairying, GoI manages livestock in India; provides veterinary services and protects animals from diseases; and disseminates information on government schemes and department facilities. The department is located at Krishi Bhawan, New Delhi.

National Livestock Mission (NLM)[2]: The NLM launched in 2014-15 focuses on employment generation, entrepreneurship development, and increased livestock productivity by increasing the production of meat, milk, eggs, and wool. It incentivizes Individuals, Farmer's Producers Organizations, Farmer's Cooperative Organizations, Joint Liability Groups, Self Help Groups, and Section 8 Companies to establish businesses under three sub-missions namely,

1. Breed Development of Livestock & Poultry,
2. Feed and Fodder Development and
3. Extension and Innovation.

1. **Breed Development of Livestock & Poultry:** This sub-mission proposes to bring a sharp focus on entrepreneurship development and breed improvement in poultry, sheep, goat, and piggery by providing incentivization to the eligible applicants. The major activities carried out under this sub-mission are as follows;

   Rural Poultry: The GoI provides a 50% capital subsidy of up to ₹.25 Lakh for promoting entrepreneurship in rural poultry with a minimum of 1000 female birds and 100 male birds along with hatchery and brooding units by applying at www.nlm.udyamimitra.in. During 2023-24 the DAHD has approved poultry proposals worth ₹.5026.47 Lakh with an approved subsidy of ₹.2199.84 Lakh[3].

	
Poultry Farm of 1100 Flock Size at Madhya Pradesh	**Sheep Farm of 525 Stock Size at Andhra Pradesh**

Sheep and Goat Breeding: The GoI provides a 50% capital subsidy for promoting entrepreneurship in sheep and goat breeding farms of a minimum of 100 female animals and 5 male animals. Applicants may apply in multiple of 100+5 units with a maximum limit of up to 500 female animals and 25 male animals with subsidies varying proportionately from ₹.10 to ₹.50 Lakh as per the scheme size. During 2023-24, the DAHD has approved 1047 proposals of sheep and goat farms, worth ₹.82152.34 Lakh with an approved subsidy of ₹.38448.64 Lakh[3].

Regional Semen Production Lab and Semen Bank: The GoI assists in the establishment of a frozen semen production laboratory for goat and a liquid semen production laboratory for sheep at the regional level in strategic locations to cater the semen of elite animals to the nearby states. During 2022-23, ₹.101.10 Lakh and ₹.75 Lakh were released to the State Government of Andhra Pradesh (Southern region) and West Bengal (Eastern region) for the establishment of regional goat semen production laboratories. Further, ₹.25.50 Lakh was released to Andhra Pradesh for the establishment of 2 sheep semen production laboratories at Banavasi and Visakhapatnam[3].

State Semen Bank: GoI provides one-time assistance up to ₹.10.00 Lakh for the establishment of a state semen bank to distribute buffalo semen and frozen semen for goats. During 2022-23 the state of West Bengal had received this assistance[4].

Artificial Insemination Centers: The existing cattle and buffalo AI centers are strengthened to additionally perform goat and sheep AI by supplying the requisite equipment like AI Travis, AI gun, etc., and by providing necessary training to the AI workers. During 2022-23, Andhra Pradesh and Arunachal Pradesh received central assistance of ₹.25.20 Lakh and ₹.3.50 Lakh for the up-gradation of 600 and 50 AI centers respectively[4].

AI technician performing AI at farmer's doorstep under phase-IV

Import of Exotic Germplasm[4]: GoI provides one-time assistance to States for the import of sheep and goat Germplasm in the form of live animals. During 2022-23, the UT of Ladakh received central assistance of ₹.253.50 Lakh for the importation of 120 Merino sheep.

Promotion of Pig Breeding[4]: The GoI provides a 50% capital subsidy for the establishment of a pig breeding farm of 50 female animals with 5 male animals (or) 100 female animals with 10 male animals. The subsidy ceiling varies from ₹.15 Lakh to ₹.30 Lakh proportionate to the size of the scheme. During 2023-24, the DAHD approved 131 proposals worth ₹.8176.64 Lakh with an approved subsidy of ₹.3218.5 Lakh.

Pig Semen Laboratory: The GoI assists in establishing a pig semen collection and processing laboratory to produce high-quality liquid boar semen for AI purposes. During 2022-23, the State of Sikkim received ₹.62.95 Lakh for this purpose.

2. **Feed and Fodder Development:** The major activities carried out under this sub-mission are as follows;

Quality Fodder Seed Production: Green fodder production has a direct correlation with improving livestock production and productivity. For green fodder production, quality fodder seed is the basic input. During 2022-23, the DAHD has released an amount of ₹.60.71 crore to undertake 36400 MTs of quality fodder seed production.

Feed and Fodder Units[4]: The GoI provides a 50% percent subsidy towards the project cost for activities focusing value addition of fodder such as Hay, Silage, Total Mixed Ration, Fodder Block, and their storage. During 2022-23, the DAHD approved 43 proposals costing ₹.4184.82 Lakh with an approved subsidy of ₹.1780.08 Lakh.

3. **Innovation and Extension:** The major activities carried out under this sub-mission are as follows;

Research and Development and Innovations: Assistance is provided to the ICAR, Central Institutes, State Government Universities, etc which are involved in research in sheep, goat, poultry, pig and fodder breeding and innovation, problem-solving start-ups, and technology transfer. During 2022-23, ₹. 216.2 Lakh has been released to various institutions under this component4.

Extension Activities: Assistance is provided to undertake activities like seminars, training and capacity building, exposure visits for Livestock Extension Facilitators, etc., at State, Central, and

Regional Levels. An amount of ₹. 994.39 lakh has been released to the States/UTs for extension activities during 2022-234.

Livestock Insurance: Risk management & insurance are implemented in all the districts of the country for the indigenous and crossbred milch animals, pack animals, and other livestock under this sub-mission. The subsidy benefit is restricted to 5 animals per beneficiary per household for all animals except for sheep, goat, pig, and rabbit, where the benefit is restricted to 5 cattle units (1 cattle unit = 10 sheep/ goat/pig/rabbit). An amount of ₹. 500.30 Lakh has been released to States/UTs for livestock insurance during 2022-23. The farmers' share of the premium has been reduced to 15% from the earlier range of 20% to 50%. The remaining premium shall be usually contributed by the Central and State Governments on a 60:40 ratio, 90:10 ratio in North-Eastern and Himalayan States and 100% in UTs [4].

Animal Husbandry Infrastructure Development Fund (AHIDF)[2]: As a part of the Atma Nirbhar Bharat initiative, AHIDF promotes the following businesses;

1. Dairy Processing & Value Addition Infrastructure
2. Meat Processing & Value Addition Infrastructure
3. Animal Feed Manufacturing Plant
4. Breed Improvement Technology & Breed Multiplications Farms
5. Animal / Agriculture Waste to Wealth Management and
6. Veterinary Drugs & Vaccine Production Facilities

The GoI is providing a 3% interest subvention throughout 8 to 10 years. MSME units can avail of up to 90% of the project cost as a term loan from any scheduled bank without any upper limit. Also, they can avail credit guarantee from the Credit Guarantee Fund Trust for Micro and Small Enterprises. Till now, a total of 642 projects have been marked as eligible by the department for AHIDF worth ₹.11071.52 Crore out of which 347 projects costing ₹.8835.76 Crore have been sanctioned and 36,524 direct employments have been created.

Other Contemporary Initiatives

National Programme for Dairy Development (NPDD)[3]: NPDD aims to enhance milk quality and increase organized milk procurement, with nationwide implementation of infrastructure for quality testing and chilling. The scheme has helped in the creation or revival of 19,010 Dairy Cooperative Societies adding 18.17 Lakh new farmer members to the system to ensure 27.93 Lakh litres of milk procurement per day. So far 35 projects have been approved with a total outlay of ₹ 1343.00 Crore. By the end of the project, 10,000 new DCS are expected to be created, which can add 1.5 Lakh farmer members to the system to create 14.20 Lakh liters of additional milk procurement per day[2].

Two thousand litre Bulk Milk Cooler at Roth, Block - Agalpur, Bolangir, Odisha under NPDD

Rashtriya Gokul Mission (RGM)[4]: **The RGM** was introduced in 2014 to ensure the development and conservation of indigenous bovine breeds to improve milk production and make dairy farming profitable for rural farmers, especially women. The National Gopal Ratna Award is one of the highest national awards facilitated in the field of livestock and dairy sector.

Dairy Processing & Infrastructure Development Fund (DIDF)[5]: Initiated in 2017-18, DIDF provides subsidized loans to upgrade processing and chilling infrastructure.

Supporting Dairy Cooperatives & Farmer Producer Organizations (SDCFPOs)[2]: This scheme provides working capital loans to dairy cooperatives, ensuring sustained operations and market access for milk producers.

Indigenous Media for IVF: The indigenous media for in-vitro fertilization (IVF) launched from Bhubaneswar on 13th September 2024 offers a cost-effective alternative to expensive imported media to propagate elite animals of indigenous breeds[4].

Livestock Health & Disease Control (LHDC) Programme[2]: This scheme aims to improve animal health by implementing vaccination programs and disease surveillance to prevent and eventually eradicate diseases.

National Animal Disease Control Programme (NADCP)[5]: Launched in 2019, the NADCP is the largest of its kind globally, targeting the eradication of Foot and Mouth Disease and Brucellosis by 2030. So far, over 99.71 crore vaccinations against FMD in cattle and buffaloes, benefitting 7.18 crore farmers have been completed.

Vaccination for PPR, CSF, and LSD: Vaccination campaigns for Peste des Petits Ruminants and Classical Swine Fever and Lumpy Skin Disease have seen substantial progress. Nearly 25.6 crore cattle have been vaccinated against LSD since 2022 and the number of cases decreased from 33.5 Lakhs in 2022 to just 47 active cases now.

Regional Fodder Stations: Eight regional fodder stations have been established by the Central Fodder Development Organizations in different agro-climatic zones and are engaged in the production of quality fodder seeds, training, and extension activities related to fodder development. As of 31.12.2022, these stations have produced 216 MTs of fodder seeds, conducted 6079 demonstrations, 118 training programs, and 75 farmer fairs[5].

Central Sheep Breeding Farm (CSBF): The CSBF, Hisar (Haryana) established in 1969 in collaboration with the Government of Australia aims at producing acclimatized exotic rams for distribution to various state sheep farms and training veterinary students and personnel in sheep management and mechanical sheep shearing.

Central Poultry Development Organizations (CPDO): The CPDOs are located in four regions viz. Chandigarh, Bhubaneswar, Mumbai, and Bangalore have been playing a pivotal role in the implementation of Government schemes for poultry development. They also promote diversification with species other than poultry like ducks, Japanese quail, etc. The Central Poultry Performance Testing Center located at Gurgaon is entrusted with the responsibility of testing the performance of layer and broiler varieties.

Mobile Veterinary Units (MVUs)[5]: 4016 MVUs have been made operational across 28 States/UTs, providing veterinary services at farmers' doorsteps via toll-free number 1962. Over 62.24 lakh farmers and 131.05 lakh animals have benefited from the same.

Conclusion

India's livestock sector continues to be a pillar of strength for the economy, ensuring food security and providing sustainable livelihoods and critical support to millions of families across the country. The sector has been a stable source of income across groups of agricultural households accounting for about 15 percent of their average monthly income. Moreover, the government of India plays a pivotal role in formulating and implementing a robust ecosystem for regulatory mechanisms towards doubling the farmer's income. The schemes of DAHD and NLM which promote animal husbandry in India and entrepreneurship in poultry, dairy, piggery, etc., not only feed millions of people with quality milk, eggs, and meat but ultimately, play a critical role in increasing employment, empowering farmers and driving rural economy and overall nation building.

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2020 Indian Agriculture Act: An Initiative Fulfilling the Unfinished Agenda of 1991 Reforms

Abstract

The agricultural acts legislated by the Government of India in 2020 were highly acclaimed at home and abroad as historic and long overdue. However, some experts, states, and stakeholders, including farmers vehemently protested against them and caused their ultimate withdrawal in November 2021. This paper presents the context and significant reasons for undertaking these policy reforms. It optimistically explores how the implementation of these acts could have benefitted the farmers and the agriculture sector in the country. It also addresses the concerns raised by farmers' leaders and critics. This article finds that the new acts would have taken forward the unfinished agenda of reforms started in 1991 by giving autonomy to farmers and vibrancy to agricultural production and marketing thereby taking Indian agriculture to new heights and ushering in the transformation of the rural economy.

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Key Words: Agriculture Acts, Contract Farming, APMC, ECA, MSP, Farmer Protest

Introduction

The Farm Acts of 2020, also known as the Indian Agriculture Acts of 2020, comprises three distinct acts namely,

1. The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020.
2. Farmers Empowerment and Protection Agreement on Price Assurance and Farm Services Act, 2020, and,
3. Essential Commodities (Amendment) Act, 2020.

These acts introduced by the Indian Parliament in September 2020 were widely acclaimed as historic, path-breaking, and an initiative fulfilling the unfinished agenda of 1991 reforms as it focused on liberalizing agriculture and increasing farmers' income. However, some experts, states, and stakeholders, including farmers vehemently protested against these acts, and caused their ultimate withdrawal in November 2021. This paper discusses the implications of all these three acts on farmers, the farm sector, APMCs, MSP, consumers, and the overall agriculture sector by discussing the arguments in favor of and opposing these acts from a bird's eye view.

Why Policy Reforms in Agriculture?

The significant reasons for initiating reforms in the agriculture sector are as follows;

Unfinished Agenda of 1991 Reforms[1]: The major policy reforms of 1991 which were attributed to liberalization, lesser government control in economic activities, and dilution of license raj did not cover agriculture. The gap in the agri-income of a farmer and that of a non-agriculture worker increased from ₹ 25,398 in 1993–94 to ₹ 54,377 by 1999–2000. In the next ten years, the income of a non-agriculture worker exceeded that of a farmer by ₹ 1.42 lakh and this trend continues. The favorable effects of the 1991 policy reforms on the non-agriculture sector and the growing disparity between agriculture and non-agriculture incomes bring a greater need for policy reforms in the agriculture sector.

Small Holdings with Small Surpluses: Farmers in India usually possess small land holdings which leave them with scanty marketable surpluses. Also, these farmers lack the finance, technology, and motivation to diversify towards high-value crops. It is not economically viable for them to take a few kilos of fruit and vegetables to the market as these crops mature in lots. If these farmers get buyers at their farm gates to procure the products with adequate price assurance as suggested by the new acts, they will be encouraged to diversify agriculture towards high-value crops.

Imbalance in Demand and Supply: India is accumulating a large surplus of agricultural commodities like wheat and paddy which could not be efficiently marketed due to inadequate market facilities, post-harvest infrastructure, and logistics arrangements while it is importing huge quantities of edible oil, pulses, fruits and vegetables which can be grown in the country and fetch increased income. Ironing out such imbalance in domestic demand and supply urgently needs these policy reforms.

Low Capital Formation[1]: Investments and capital formation are essential for the progress and growth of business in any sector. Its growth rate in Indian agriculture has fallen close to 10% per year from 2002–03 to 2011–12 to 2% and the trend is continuing. The private corporate sector has almost avoided making investments in agri-sector in recent times. The private investments in this sector constitute less than 2% of the total investments in agriculture and less than 0.5% of the total annual investments of the corporate sector in the Indian economy. The new acts could help revive investments in agriculture and modernize the sector.

Price Challenges in Fragmented Markets: Despite the developments in communication, road networks, and other trade infrastructure, agri-markets in India remain fragmented with significant price fluctuations. There is also poor integration of prices between the harvest and lean seasons. There is found an unjustified spread between farm to retail price due to reasons like low investments in storage and warehouses and dominance of local traders etc. The new acts would be handy in regulating such market anomalies.

Growth in Food Processing: The growth of food processing needs to be accelerated to match the rising demand, encourage agri-diversification, and create more jobs in the rural economy. Processors need raw materials of the desired quality and at the desired time. Buying small lots of agricultural commodities with different quality in scattered markets adds more to the cost of raw materials. This requires new arrangements and partnerships between processors and producers as suggested by these agriculture Acts.

MSP Doesn't Guarantee the Growth[1]: The growth rate in cereals where MSP and other government interventions are quite high remained at 1.1% after 2011-12 while segments such as horticulture, milk, and fishery where MSP and government intervention is nil or negligible show 4-10% annual growth. This indicates that in recent times the liberalized markets as suggested by the new acts are more favourable to agricultural growth than assured MSP and government intervention.

Expanding MSP is Too Costly: Farmers demand remunerative prices for their products through MSP and government procurement. Government intervention through MSP-backed procurement is required and possible only for certain selected crops to ensure food security and price stability. Expanding MSP to all crops involves a heavy fiscal burden on the government. The agri-acts by allowing direct connectivity between farmers and producer firms give a workable solution to this problem.

Improving Exports[1]: The declining population growth rate in India has resulted in the declining growth rate in aggregate demand for certain food grains in the domestic market which compels the country to sell around 20–25% of the incremental agri-products in overseas markets. This is not possible with the current marketing system struggling with large intermediaries, small market lots, and high transaction costs. For example, reducing the logistics cost which is about 15% to at least half is inevitable to make our products competitive in export markets. The policy reforms could make this process possible.

One Nation One Market: With the rise in specialization and commercialization of agriculture, most of the farm outputs produced in a state are consumed outside states rather than consumed by the producer states themselves. The new acts support efficient and barrier-free interstate trade in the spirit of one nation one market.

Analyses of 2020 Agriculture Acts: A Bird's Eye View

The detailed bird's-eye view analyses of the three Agriculture Acts 2020 are as follows;

1. **The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020:** The FPTC Act 2020 allowed the farmers to directly sell their agricultural produce to private buyers outside the Agricultural Produce Market Committee (APMC) mandies. This was done by diluting the monopoly of government-regulated mandies, removing the barriers to inter-state trade, and allowing e-commerce facilities to sell agricultural commodities. It expands the scope of trade areas for agri-produces from select areas to any place of production, collection, and aggregation. Also, the act prevents state governments from imposing any market fee, cess, or levy on farmers, traders, and electronic trading platforms for trading the agri-produce outside the trade area[2].

Pros: The arguments made in favor of the FPTC Act 2020 are as follows;

- The FPTC Act 2020 addresses the shortcomings of the Agricultural Produce Market Committees (APMC) Act 2017 which is criticized for promoting centralization, reducing private competition, and causing excessive market fees and commissions that would harm the agricultural sector.
- The act aims to break the monopoly of the government-regulated mandies in agriculture marketing and allows the farmers full autonomy to directly sell their produce to private buyers bypassing the APMCs.
- The act allows private players to procure agri products at the farm gates which would reduce the marketing costs that include transportation costs. Also, farmers will be able to get a greater share of the price paid by customers, which currently stands at 15%.
- This would help increase rural incomes and rural demand which in turn would boost the economy at a large.

Cons: The arguments made in opposition to FPTC Act 2020 are as follows;

- Agriculture and markets being state subjects (entries 14 and 28 of Article 246, List II) these new acts are perceived to be a direct encroachment upon the functions of the states and against the spirit of cooperative federalism enshrined in the Constitution.
- Encouraging tax-free private trade outside the APMC mandies will make these notified markets unviable, which would end the Minimum Support Price (MSP) backed government procurement of food grains.
- When more and more trading moves out of the APMCs, these regulated market yards will lose revenues, and big corporate houses will overtake markets and procure farm produce at incidental rates.
- Diluting the market monopoly of APMCs and diverting agricultural trade towards private mandies could lead to the loss of states' revenues from mandi taxes and fees which is currently 8.5% in Punjab to less than 1% in some states. Middlemen working with APMC and traders would also be affected to a great extent.

2. **Farmers Empowerment and Protection Agreement on Price Assurance and Farm Services Act, 2020:** The APAFS Act 2020 (or) Contract Farming Act 2020 provides a national framework for contract farming by allowing the farmers to enter into written contracts with sponsor companies and produce mutually agreed agri products at predetermined prices. The agreement is made before commencing the production with clear terms and conditions for the supply, quality, grade, standards, and price of farm produce or services. Also, the act provides a three-level dispute resolution mechanism consisting the 1. Conciliation Board, 2. Sub-Divisional Magistrate and 3. Appellate Authority[2].

Pros: The arguments made in favor of the APAFS Act 2020 are as follows;

- Contract farming allows the small and marginal farmers to transfer the risk of market unpredictability towards the sponsoring firms and thereby reduces the marketing costs and risks.
- Contract farming facilitates farmers to engage in direct marketing, eliminates intermediaries, reduces marketing costs, and helps them realize better prices and farm income.
- Contract farming enables farmers to access modern technology to increase farm productivity and reduce input costs. Contract farming agreements between companies and farmers are already operational in certain crops.
- Of the overall potato procurement, 50% comes from contract farming. For its potato supplies PepsiCo has worked with more than 12,000 farmers working on over 6,400 hectares across Punjab, Uttar Pradesh, Karnataka, Bihar, West Bengal, Gujarat, and Maharashtra[3].

- The sponsor firms not only undertake assured buyback at pre-determined prices but also supply the farmers with required inputs like seeds and equipment etc., to ensure the produce of desired standards is grown.
- The legal framework empowers the farmers and protects their interests as it envisages a mutually agreed remunerative price framework for farm produce.
- The sale, lease, or mortgage of farmers' land is totally prohibited under this act. Farmers' land is protected against any recovery. Also, an effective dispute resolution mechanism has been provided with clear timelines for redressal.

Cons: The arguments made in opposition to the APAFS Act 2020 are as follows;

- The small and marginal farmers often lack the awareness and literacy to understand the terms and conditions of contract farming which may lead to their exploitation.
- The farmers lack bargaining power with big companies. The formal contractual obligations

are usually unorganized in nature. Also Indian farmers lack of resources for a legal battle with private corporate entities.

- Though the provisions of the act offer protection to farmers against price exploitation, it does not prescribe the mechanism for price fixation. The free hand given to private corporate houses could lead to farmer exploitation.

3. **Essential Commodities (Amendment) Act, 2020:** The Essential Commodities Act 2020, or ECA 2020 removes certain food items like cereals, pulses, oilseeds, edible oils, onions, and potatoes from the list of essential commodities. It aims to deregulate the production, storage, movement, and distribution of these food commodities. The act also removes stockholding limits on certain items except under extraordinary circumstances like war, famine, natural calamity, and extraordinary retail price rise exceeding 100% in horticultural produce (onions and potatoes) and 50% for non-perishables (cereals, pulses, and edible oils). It mandates that any imposition of a stock limit on agricultural produce must be based on a price rise. The act allows agribusinesses to stock food articles of any quantity by diluting the government's ability to impose arbitrary restrictions[2].

Pros: The arguments made in favor of ECA 2020 are as follows;

- The ECA 2020 addresses the shortcomings of ECA 1955. Since large stocks held by traders could be outlawed under the ECA 1955 anytime, traders tended to buy far less than their potential capacity resulting in huge losses to the farmers during surplus harvests of perishables.
- The threat of restrictions posed by ECA 1955 acts as a disincentive for private investment into cold storage, warehouses, processing, and export activities. The deregulation of ECA 1995 would attract more FDI and private sector investment into the farm sector 3.
- Increased private sector investment would help build robust supply chain infrastructure for the agricultural sector. This could facilitate trading Indian food articles in the global markets.

Cons: The arguments made in opposition to ECA 2020 are as follows;

- Easing the essential commodities trade would allow the exporters, processors, and traders to hoard farm produce during the harvest season, when prices are generally lower, and release them for sale when prices soar which would threaten the food security of the country.
- Excessive freedom in the essential commodities trade would lead to irrational price volatility of food items and increased black marketing.
- The new act proposes a price trigger mechanism that is vague and wide for invoking ECA. Price triggers under this mechanism lack clear-cut guidelines as it does not have a reference to a locality.

Final Note in Favour of the Agriculture Acts

1. According to Shanta Kumar Committee's report based on National Sample Survey data 2015, it is worth noting that only 6% of farmers actually sell their crops at MSP rates. Further, this law did not state anywhere that the current system of MSP-based procurement of food grains particularly wheat and paddy by government agencies would end 3.
2. Purchases in state-regulated APMC mandies will continue as before. The APMCs wouldn't prevent farmers from selling their produce or traders and processors from buying in these mandies.
3. The laws provide farmers with an alternative platform to sell like a factory premise/processing plant, produce collection center, cold storage, warehouse, silo, or even the farm gate. Transactions in such trade areas will not be charged APMC market fees or cess4.
4. The act explicitly prohibits any sponsor firm from acquiring the land of farmers through purchase, lease, or mortgage. Also, contract-based cultivation is voluntary and farmers cannot be forced into an agreement. Therefore there is no need to fear that the small and marginal farmers to be swallowed by big corporates.
5. The Indian farmer constitutes 40 percent of the country. Indian economic and social development depends upon the empowerment of the farmers and the rural segment of our population. Thus there is an urgent need for agricultural sector reforms to move beyond the antiquated agricultural policies.
6. The Indian farm bills are in line with international precedence wherein a number of developing economies have been making changes to their agriculture policies since the 1990s to encourage private sector involvement which would provide a major fillip to the sector. The International Monetary Fund has also backed the recent farm acts as being an important step in the right direction.

Conclusion

Visit Bharat 2047 is the Government of India's vision to make India a developed nation by 2047, the 100th year of its independence. The foundation of this vision consists of the Youth (Yuva), Poor (Garib), Women (Mahila), and Farmers (Kisan) 4. The Government is working towards achieving all-round development of the country by empowering and improving the capabilities of people and expanding the GDP from $3.4 trillion to $30 trillion by 2047.

The three policy reforms undertaken by the GoI are to be perceived from this perspective as their primary objective was empowering farmers and enhancing their income level under improved cultivation and market conditions. If they are implemented in the right spirit, it will prove to be an initiative fulfilling the unfinished agenda of 1991 reforms as it would enable farmers to fetch benefits in a competitive environment that could iron out the income differences found between farmers and nonfarm sector people. The reforms have generated optimism for India to become a global power in agriculture, ensuring farmers' prosperity and thereby attaining the ambitious goal of developed India by 2047.

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Future of Indian Agriculture: Challenges and Priorities

Abstract:

Agriculture is one of the pillars of our national economy, and effective implementation of policies and strategies, programs for awareness with digitalization initiatives—such as precision farming models — are crucial for economic development of India. Addressing the worrying issue of farmer suicides still remains a significant challenge which needs immediate actions. Major concerns include the poverty among Indian farmers and its severe consequences like tragic outcomes; the declining share of agriculture in national GDP of India; and the inadequate opportunities available for women in this sector.

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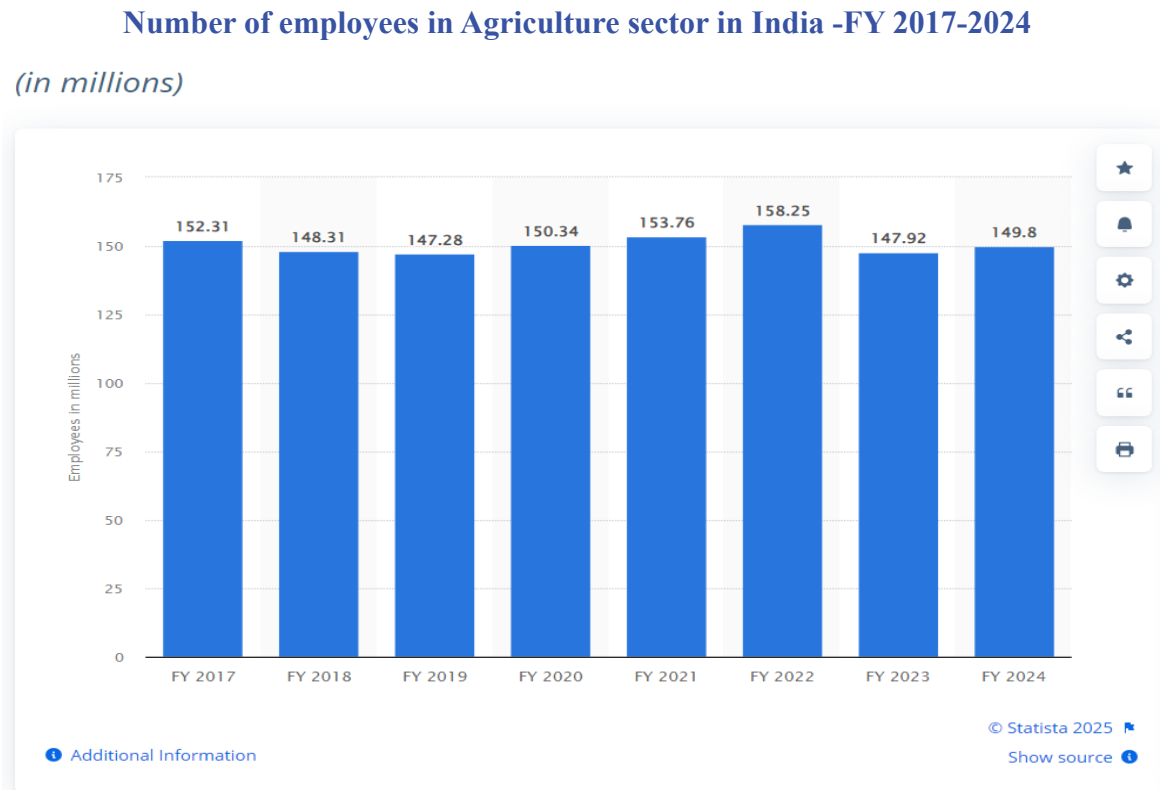
To overcome these challenges and for fostering process to become self-reliance in agriculture and for overall economic growth with sustainability, it is essential to explore remedial measures. In this article focus is placed on these critical issues and some solution strategies.

Key words: Gross Value Added (GVA), Sustainability, Strategy, Urbanization, Farmer, Livelihood, Precision Farming, Yield, Infrastructure, Skill development, Feminization, Gender, Harvestable land, Hindrances, Value Chain, Empowering, Diversification, High-value crop

Introduction

Agriculture has played an essential role in human life since the early days of civilization. Though initially, meeting the demand for food was the primary objective, gradually it become a major contributor to national socio-economic growth. Presently, the agricultural sector remarkably contributes to Gross Value Added (GVA) and also provides substantial employment portion of the workforce of our country.

In an agrarian economy like India, agriculture and allied activities are strong pillars of the national economy, engaging about 58% of the total population and contributing approximately 17% to the national GDP according to the Forward Statement of the Annual Report 2020 published by the Indian Council for Agricultural Research (ICAR) (ICAR Annual Report 2020)[1] and also in Sector wise GDP of India Ministry of Statistics and Program Implementation published on 02.10.2024 in the website of Statistics Times (Statista)[2],



Source: Statista, weblink keyword :'https://www.statista.com/statistics/1284035/india-employment-in-agriculture-sector

Despite its pivotal role in India's economy, our agricultural segment faces various challenges that threaten the productivity and sustainability of the sector. The most critical issues such as degradation of land, scarcity of water for irrigation, unpredictable monsoon behavior play a deterrant role. Besides, insufficient application of latest technology and awareness programs hinder the grow of this vital sector in our country.

Moreover, small and fragmented landholdings form a significant portion of harvestable land in India. Farmers often struggle with burden of debt as a result of unstable market prices and ever rising input costs. The situation is further exacerbated by the climate change which adversely affects farmers' activities, yields of crop, and also national food security. We frequently get reports of farmer suicides, primarily stemming from their unbearable burden to repay loans and interest and also to sustain their livelihoods.

Such circumstances demand immediate attention from the government, corporates, and the public at large to rescue underprivileged poor farmers suffering from poverty. India can only prosper and become a self-reliant economic power through collective efforts including implementation of policies towards improving agriculture sector and the conditions of farmers as well.

This article delves into these critical aspects in greater detail and suggests areas for our focused action to nurture farmers and accelerate agricultural growth, thereby reinforcing our socio-economic fabric.

The following table obtained from the published article by Statista, shows the pattern of employees engaged in Agriculture sector in India.

Declining Share of Agriculture in India's Economy – reasons and possible solutions

According to the data on agricultural statistics published by PRS Legislative research although this sector employed 50% of the workforce, its share in India's GDP is as low as 17.5% for the year 2015-16. Furthermore, the statistics from their report indicate that during 1950-51 agricultural sector contributed as much as 54% of national GDP, which declined over the past nearly 75 years to a substantially low level in 2015-16. Most interestingly, in 2015-16 the contribution to national GDP from Industry (10.5%) and Service sector (24.4%) were remarkably high (PRS 2015-16)[3]. This indicates that the shift in contribution from agriculture to industry and service sector is mainly due to urbanization and industrial growth in the country over the last seven decades, in addition to other factors such as weather patterns, variability of monsoon, rain fall irregularity and farmers searching for better income opportunities.

This sharp decline in the agriculture sector's contribution to our national economy is a cause of great concern on many fronts, like, food security, economic growth, sustainability and improving livelihoods of our rural population and in turn affect our urban cluster in indirect way. It is imperative to identify the causal factors playing significant role in this regard and to explore the effective solutions for revamping the agriculture segment of our country as a top priority. The primary reasons for such decline and possible solutions are narrated below.

Primary reasons for declining trend of Agriculture:

1. **Shift from rural to urban life style and employment**

   - In last few decades, due to the fast growth of urbanization, the migration of a remarkable share of our working population caused a gradual shift from rural employment to urban jobs in search of better remuneration and job security.

2. **Declined quality of harvestable land, lack of fund and latest technology:**

   - Salinity of soil, repetitive usage of fertilizers, continuous production of crops on same part of land are causing lower productivity, the smaller farmers who make up a significant segment as a group, individually suffer from accessing the economy of large-scale operation and fail compete with the large entities as contestants, in the market.

3. **Other factors**

   - Besides the above reasons, other factors like continuous fluctuations of market conditions, inadequate government support and lack of awareness among farmers constitute the large part

of deterrent factors. Moreover, the reduced water supply for irrigation, inefficient agricultural processes and wide variations in monsoon trends and rainfall together hinder the growth of agricultural sector.

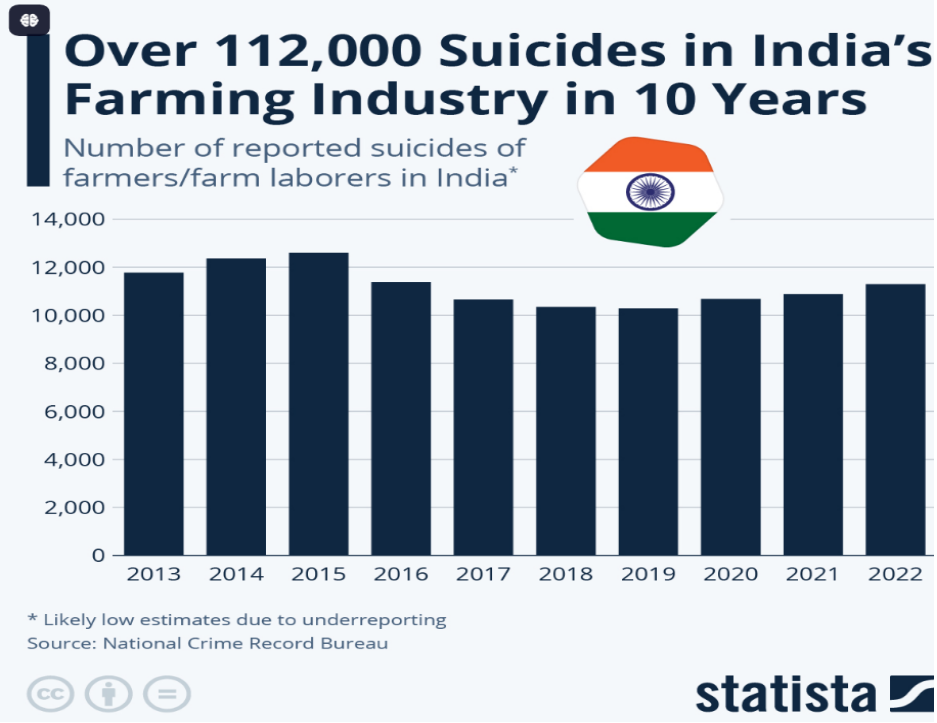
Some solutions to overcome the hindrances of the Agricultural sector

1. **Infrastructure enhancement:**
   - Adequate storage facility, appropriate logistics for movement of inputs and output, better financial support system at affordable cost among other factors.
2. **Endorsing Sustainability:**
   - Implementing improved techniques of production and ensuring rotation of crop cultivation, agro based forestry, organic seeds and farming and investing in research for bringing in more robust crop varieties for sustainable agriculture and ensuring healthy products for the consumers.
3. **Market restructuring:**
   - Promoting the consolidation of the market for agricultural inputs and outputs by enhancing the reforms to support fair competition will allow the small farmers to have the fair opportunities and income for their survival and growth, while removing the manipulation by middlemen.
4. **Establish healthy Credit and Insurance coverage:**
   - Extending current credit availability and crop insurance schemes to a greater height can further encourage the farmers by providing required source of fund and the risk coverage. These measures will give further impetus to the rural population to improvise their skills and resources in the agro sector.
5. **Other aspects: Education and Skill Development:**
   - Implementing skill based training with awareness programs for individuals involved in this sector with impart required knowledge about the latest practices including technological development, research outcomes, market in agriculture.
   - Besides the above, government policies need to be realigned with the changing scenarios of our country's agro-economy and proper channels to utilize the land and farmers for achieving the target of making India self-reliant and higher foreign exchange earner through the performance of its agro sector.

With a focused approach towards implementing integrated actions (technology, government policy, research work etc.) the hindrances faced by our agriculture sector can be considerably reduced leading to improvement of performance and productivity.

Farmers' suicide – consequence of poverty and possible solutions

In an agrarian economy, farmers are the pillars who uphold the agricultural platform. However, it is a paradox, the baseline farmers who generate agro products continue to suffer from severe poverty due to financial losses. Sometimes, they choose the worst path to sacrifice their lives after failing to meet even their basic monetary need for their families. The statistics of Farmers' suicide during the last decade (2013-2022), shows significantly high number of such incidences in India. As published by Statista, around 112,000 number of suicides committed by the farmers in India in last decade (Statista 2022)[4].



However, one important indication we observe from the above graph is that during the decade (2013-2022), the number of deaths of farmers in India was in the range of 10,000 to slightly over 12,000 per year (Statista)[5]. Another document on Farmers' suicide in recent time is the report authored by Dominic Merriot, UK, published by the PubMed Central (PMC) under National Library of Medicine, which shows that about 166,000 farmers committed suicide (around 16,000 per year) during the period between 1995 and 2006 (i.e., in a decade). It gives an indication of marginally reduction in the average rate of such farmers' death in India. However, there is a long way to go to remove such tragic situation leading to end of the life of our food growers. This report also explains that the suicides by the poor farmers are more on account of their financial causes rather than psyche reasons. This is further supported by the statistics for the years from 1995 to 2014 as per data in table below mentioned in an article titled "Farmer suicides in India – trends, causes and policy" by Geeta Ozwald Menezes published in ResearchGate in July 2016. It shows the number of suicide by farmers had some rise and falls during 1995 to 2014 hovering around 10,000 to 18,000 per year and 12,360 in 2014 (Researchgate Report)[6].

Number of Farmer Suicides in India

Year	No. of Farmer Suicides	Year	No. of Farmer Suicides
1995	10720	2005	17131
1996	13729	2006	17060
1997	13622	2007	16632
1998	16015	2008	16196
1999	16082	2009	17368
2000	16603	2010	15964
2001	16415	2011	14027
2002	17971	2012	13754
2003	17164	2013	11772
2004	18241	2014	12360

Source: NCRB

The major causes: The primary cause of farmers' suicide in India is their poverty and as a consequence, their inability to service their debts they owe to their lenders. A high rate of interest, adverse condition of private loans, a very low rate of profit (frequently suffer loss), uncertainty due to hasty monsoon, drought etc., contribute to the misfortune of farmers, sometimes leading tragic ends.

Some possible solutions: To help the farmers, various governmental initiatives have been taken both at center and state levels. Still, the need for further protection of farmers are required to save our own lifeline. In this regard, the poor segment needs to be supported by way of soft loans, protection during their failure of repayment and interest payment on time with opportunity for extended terms in such situations, removal of intermediaries by establishing appropriate economic logistics. Additionally, providing cheaper seeds, fertilizers, and digital platform to provide farmers with valuable information on a real-time basis covering broad area of the farming community is essential. Forming more associations of farmers can help to protect their common financial interest and safety to survive and grow further. State-run insurance companies to offer more beneficial policies to farmers to reduce their financial loss and protect their lives as well. Further awareness programs, covering, inter alia, digital platform usage literacy and improving network infrastructure will help significantly in this direction.

Increasing agricultural yields, diversification to higher value crops and developing value chains – tools to overcome the hindrances faced by Indian agriculture sector

Increasing Agricultural Yields

Important measures for increasing the agricultural yield include adopting high-yielding varieties of crops, improving irrigation system, using the latest developed fertilizers with minimal effect of soil health and implementing mechanized operations supported by digital platform (like Precision Farming) which India has already started and gradually expanding its coverage. There is a sharp increase of yield of rice from 1,740 Kg/hectare in 1991 to approximately 2,873 Kg/hectare in the year 2024. (Statista report) in their site[7].

International Food Policy Research Institute (IFPRI) estimates Precision Farming in India can bolster the agricultural productivity through proper resource management.

Diversification to Higher Value Crops

It is obvious that to combat diverse challenges - for example, on one hand, meeting the increasing demands of the crops and, on the other hand, ensuring farmers' reasonable income to survive and grow - high yielding varieties alone cannot meet both goals. To improve the level of income from crops, diversification into Higher Value crops is absolutely necessary. Such crops include, horticulture covering fruits and vegetables, which provide a higher return. A study report of Indian Council of Agricultural Research (ICAR) suggests that the need for shifting from cereal production to high-value crops could significantly increase the income of Farmers'. Working in this direction, the horticulture crop cultivation initiative witnessed a remarkable increase in land cultivated for horticulture production in 2021-22, reaching 6.416 million hectares, according to report of National Horticulture Board, Nov-Dec 2023 (NHB Nov-Dec 2023)[8]. The following table is extracted from the above report.

Table 2. State-wise area of horticultural crops ('000 ha) in 2021-22

State	Gross cultivable area	Fruits	Vegetables	Plantation crops	Aromatic & Medicinal	Flowers	Spice	Total	% of Gross cultivable area
Arunachal Pradesh	301	30.09	2.62	1.60	0.24	0	12.33	46.88	15.57
Assam	4,060	161.98	306.23	90.48	4.62	5.307	100.14	668.76	16.47
Manipur	437	43.12	38.35	0.9	0.04	0.07	9.34	91.82	21.01
Meghalaya	303	37.38	49.61	27.73	0	12.47	14.52	141.71	46.77
Mizoram	188	66.47	40.67	21.45	0.77	0.08	27.82	157.26	83.65
Nagaland	504	34.41	41.51	3.41	0.08	0.04	12.03	91.48	18.15
Sikkim	137	20.17	22.44	0	0	0	42.44	85.28	62.25
Tripura	486	57.72	54.74	16.21	0	0	7.26	135.92	27.97
Total	6,416	431.17	533.74	161.78	5.75	17.967	183.44	1333.8	20.79

Indian Horticulture

The cultivable land for horticulture in 2010 was only 0.5 million hectares as per the NHB's 2010 report.

Developing Value Chains

From the reports of World Bank, we find more than expected facts. Their findings estimate that close to one-third of agricultural produce in our country is wasted due to poor post-harvest management and inadequacy of proper storage and logistic facility. The obvious solution to this problem lies in, inter alia, developing value chains i.e., the post-harvest storage and logistic facilities along with an improved management system covering marketing of agricultural products.

In this regards, the platforms and E-commerce solutions like AgroStart and Ninjacart facilitate the direct link between farmers and consumers towards maximizing the surplus producers who grow the products, aiming towards eliminating the need for middlemen intervention. NASSCOM in their NASSCOM Community website report, it is expected that the digital platform and E-commerce systems can generate a sizeable market in Indian agriculture through these direct link channels mode[9].

Feminization of Agriculture

It is well said by Dr M. S. Swaminathan, renowned Agriculture scientist that the first domesticated crop plants came through the hands of women and they made agriculture an art and science of farming. Still the progress in the field of feminization of agriculture is far behind than what it should have been. During last few decades, as a result of industrial growth along with the urbanization of our society, a large male workforce is shifting from agriculture to industry and service sectors. As a result, the Agricultural sector is suffering from a shortage of efficient workers. However, due to gradual increase in the entry of women in this field, production has not been affected to the same extent as the decline of the male workers.

Women workers in this field face many challenges, including unsafe work condition, social taboos, undue pressure to manage both home and work fronts simultaneously. It is evident that to raise the potential of agricultural activities, women will play a significant role. ICAR research revealed that the participation of women is 75% in the cultivation of major crops, 79% in horticulture, 51% in Post- harvest work, 95% in Animal husbandry and Fisheries. The extent of involvement of women in agriculture covers the activities

from sowing, weeding, irrigation, protection of plants. Besides these, female force also takes the lead in harvesting and post-harvest works. Surprisingly they also play an active part in their domestic duties, such as cooking, raising child, collection of water, gathering fuel wood and maintaining the household. Moreover, farm women also participate in cattle management, collection of fodders, milking, etc as published in the Article titled, Feminization of Indian Agriculture authored by Someshwari S and Bhagavathsingh C published in a journal (Just Agriculture Feb 2024)[10].

In view of the above, along with other measures, women empowerment and involvement in Indian agricultural scene are relevant and the need of the day to achieve productivity not only in the domain of agriculture but on overall prosperity of our country. Side by side, governmental support in the form of subsidy, soft loans, inputs at cheaper rates, safe and healthy working condition must be provided to women farmers to make the sector improve and grow more meaningfully for the nation.

Conclusion

To make India a strong economic power, it is imperative to strengthen its agriculture sector and operate with latest technology. Multi-fold actions covering increasing the agricultural yields, opting for higher-value crops, and evolving efficient value chains are decisive strategies for revitalizing the agricultural sector of India. With enhanced potential for higher productivity with profitability, the measures can empower farmers and the women workers, securing food supply and contribute to the overall economic growth of our country.

Modelling the plans and executing these strategies, with proper impetus and support through necessary investment in infrastructure and technology, is crucial for the sustainable future of agricultural sector in India. A comprehensive action plan and strategy covering all the influencing contributors for development of agriculture need to be adopted to reach the goal of making the country self-reliant and achieving Vikshit Bharat 2047.

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Indian Agriculture at Crossroads: Strategies for Sustainable Growth and Prosperity

Abstract:

Through this study, the critical challenges and potential solutions for revitalizing Indian agriculture, emphasizing the urgent need for sustainable growth and prosperity of the Indian Agriculture is tried to explore. The governance system in India has long neglected rural communities and small farmers, leading to systemic issues such as farmer suicides, social unrest, and environmental degradation. The paper critically examines the failures of current agricultural policies, highlighting short-term political focus, inefficient pricing mechanisms, bureaucratic inefficiencies, and limited access to resources. It also emphasizes the importance of environmental sustainability and adequate infrastructure for agricultural development. Drawing on international case studies, the article advocates for transformative reforms, such as the establishment of Export Production Villages (EPVs) to boost rural exports and promote innovation, and the development of integrated infrastructure to enhance agricultural efficiency. Key recommendations include policy revisions, capacity building, improved stakeholder participation, and investment in digital and market-oriented agriculture. The article concludes by asserting that these reforms can significantly improve farmers' livelihoods, enhance food security, and drive inclusive economic growth, benefiting all stakeholders in the agricultural ecosystem.

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Keywords: Indian agriculture, sustainable growth, rural development, Export Production Villages (EPVs)

1. Introduction

Governments often prioritize urban development over rural areas, neglecting the genuine needs of small farmers & rural communities. The Major Consequence of Neglecting Agriculture and Small Farmers leads to SOCIAL UNREST The British colonial legacy has had a lasting impact on India's governance structure. The country's administrative systems, laws, and policies have been largely inherited from the British, with

minimal revisions over the years. The present set of farmers' protests & clamour for reservations deserves to be viewed and understood in the above context. The issue of farmer suicides is a heartbreaking example of the government's failure to prioritize the well-being of the marginalized rural communities. The lack of support and resources for the farmers, combined with the pressure to repay debts, has driven many to desperation. This is a clear violation of their human rights, particularly the right to life and livelihood. Also, it is puzzling why government's often seem to forget their role as the holistic custodians of the nation's wealth and money. There are several factors & reasons that contribute to this phenomenon:

- Short-term focus.
- Lack of accountability.
- Influence of Special Interest Groups.
- Bureaucratic inefficiencies.
- Urban bias.
- Ungraspable issues surrounding food & agriculture that defy solutions.

2. Challenges in Reforming Governance

India's agricultural policies have indeed been criticized for not adequately supporting farmers. Despite various initiatives, the sector still faces numerous challenges. The government has established several committees, ministries and departments to address agricultural issues, but their overall effectiveness is very less. Serious rethinking needs to be done regarding the "Doubling Farmers Income Scheme" launched by the Central Government in February 2016, with the goal to be achieved by 2022-23. The Government has been unable to 'increase the sources of income.' (as was envisaged in their press release dated 13 DEC 2022 by PIB Delhi).

i. Institutional inertia

The existing governance structure has been in place for so long that it has become entrenched, making it difficult to reform. Hardcore interests and bureaucratic resistance have hindered and prevented reforms, even when they have been absolutely necessary and beneficial. It is essential for the government to promote 'merit based decision making' with 'Clear Policy Frameworks', 'Public Disclosures', and 'Independent Oversight'.

ii. Resistance to change

The "OLD IS GOLD" mindset makes it very difficult to introduce new ideas and reforms. Despite the potential benefits from setting up of "Export Production Villages", the decision-takers have aborted them at the outset, the chances of advancement of the farmers. Agri-Exports have been systematically left out of the VIKSIT BHARAT PROGRAM.

It is high time for the government to provide incentives for innovation, such as funding and awards, to encourage bureaucrats, farmers, citizens, and consultants to suggest and help GOVERNMENT to adopt innovative organizational support arrangements.

iii. Lack of political will

Government is hesitant to undertake significant reforms due to political considerations or fear of disrupting the status quo. Having a short-term focus,the politicians often prioritize short term gains such as winning elections, over long term investments in agriculture. Again, insufficient or ineffective

policies hinder the development of a sustainable and prosperous agricultural sector.

iv. Inefficient Pricing Mechanisms

The Minimum Support Price (MSP) system, intended to protect farmers from price fluctuations, has been criticized for not adequately benefiting smallholder farmers. Innefficient marketing systems and lack of market access limit the farmers' income potential.

v. Limited Access to Resources

Small and marginal farmers often struggle to access credit, technology, and markets, hindering their productivity and income. And making no budgetary allocations for establishing innovative multi-tasking, organizational and institutional, supporting arrangements is limiting their ability to collectively negotiate better prices, access markets and share resources.

vi. Environmental Degradation

Intensive farming practices have led to soil degradation, water depletion, and biodiversity loss, threatening the long-term sustainability of Indian agriculture. And the inertia has perpetuated indefensible agricultural practices, contributing to environmental degradation and depletion of natural resources.

vii. Inadequate Infrastructure

Poor rural infrastructure, including storage facilities, roads, and irrigation systems; digital infrastructure like reliable & fast internet access, mobile apps and dedicated digital payment systems, exacerbates the challenges faced by farmers.

1.4 billion adults worldwide remain excluded from formal financial services and 54% of them are women. By embracing and investing in transformative digital systems, we can unlock women's full potential and create a more inclusive and equitable world.

Reaping the full benefits of DPI (Digital Publifrastructure) requires a shift away frosiloed digital platforms toward inclusive DPI that supports equitable access to essential services.

Training and extension services that provide the farmers with training, advice and support on best practices, technology adoption, and market access to reduce transaction cost and increasing financial inclusion.

3. Some Case Studies across the Globe

i. Netherlands

The Netherlands has a highly efficient and streamlined governance system for food and agriculture. Their approach to agricultural policy, innovation, and sustainability can serve as a valuable model.

ii. Denmark

Denmark's agricultural sector is known for its high productivity, sustainability, and animal welfare standards. Their governance structure and policies can provide insights into how to balance economic, environmental, and social considerations.

iii. Singapore

Singapore's approach to food security and agricultural development can serve as a valuable example.

Their emphasis on innovation, technology, and sustainability has enabled them to achieve high levels of food security despite limited land and resources.

iv. Kenya

One Acre Fund, a remarkable organization that has been transforming the lives of smallholder farmers in the Kakamega Region of Kenya. Their approach, simulated by Andrews Yoon, focuses on providing comprehensive support to farmers. Kenya has also pioneered the cultivation and multipurpose use of orange-fleshed sweet potatoes(OFSP).

v. Sri Lanka

"Economies grow on endogenous innovation," said Paul Romer, winner of Nobel Prize 2018 for Economics. And enlightened with this Sri Lanka has decided to establish 5000 Export Production Villages with an aim to generate 9 million dollars' income. This massive rural development project has been approved by the World Bank.

vi. Malaysia

Malaysia's commitment to agricultural advancement and rural development has indeed paid off!

Malaysia has made significant strides in modernizing its agriculture sector, adopting innovative technologies, and promoting sustainable farming practices. Some notable initiatives include:

1. **Precision agriculture:**

   Malaysia has invested heavily in precision agriculture, leveraging technologies like drones, satellite imaging, and data analytics to optimize crop yields and reduce waste.

2. **High-tech farming:**

   The country has established high-tech farming facilities, incorporating advanced hydroponics, aquaponics, and vertical farming systems to increase productivity and reduce environmental impact.

3. **Agricultural research and development:**

   Malaysia has strengthened its agricultural research and development (R&D) capabilities, focusing on improving crop varieties, disease management, and post-harvest handling.

These efforts have contributed to Malaysia's impressive agricultural growth, making it a leader in the region.

Regarding the happiness index, Malaysia's focus on rural development, poverty reduction, and social welfare programs has contributed to its high ranking. The country's multicultural society, rich natural heritage, and vibrant culture also play a significant role in fostering a sense of well-being and happiness among its citizens.

Malaysia's success story serves as an inspiration for other countries in the region, demonstrating the potential for agricultural advancement and sustainable development to drive economic growth, social prosperity, and environmental stewardship.

4. Effective Steps for Streamlining Food and Agriculture Sector

After comprehensive study of current agriculture scenario in India, following recommendations with multi-

faceted approach, can be made to streamline Agriculture sector:

i. Review and revise laws and policies

Conduct a thorough review of existing laws, policies, and regulations governing food and agriculture. Revise or repeal those that are outdated, redundant, or hindering progress.

ii. Simplify administrative processes

Streamline administrative procedures, reduce bureaucratic hurdles, and introduce digital solutions to improve efficiency and transparency. Encourage Decision Takers to attend World Bank Internship Programmes.

(To advance their VISION on Rural Poverty Reduction)

iii. Encourage stakeholder participation

Foster collaboration between government agencies, farmers, agricultural experts, agri and food product exporters, food mall operators, and other stakeholders to ensure that policies and programs are informed by diverse perspectives and smart farming needs.

iv. Invest in capacity building

Provide training & capacity-building programs for government officials, farmers, and other stakeholders to enhance their skills and knowledge in areas like agricultural technology, marketing, modern farming methods, and start-ups / entrepreneurship.

v. Promote transparency and accountability

Implement measures to ensure transparency and accountability in governance, such as regular audits, public disclosure of information, and mechanisms for citizen feedback and grievance redressal.

vi. Remove Anomalies

The Central Government Authorities decide MSP, but States do actual Procurement. The biggest sufferers are the farmers In Maharashtra, (who grow - cotton, maize, soybean, sugarcane, onions, fruits and other vegetables like tomatoes) who rarely get the real benefits of the MSP regime due to complexity & multiple steps in paperwork, and lack of economies of scale for marginal farmers.

vii. Establish EXPORT PROCESSING / PRODUCTION VILLAGES (EPVs) in India.

Similar to those in Sri Lanka, it could be a great way to boost exports, create jobs, and promote economic growth.

To set-up ENGINES OF GROWTH and foster export led economic development MIRACLES which have been replicated by many newly industrialized countries like Ghana, Malawi, Thailand, Sri Lanka etc. need to be adopted by our country to stimulate production and commercialisation of the farming and rural sector for exports.

There is considerable potential for increasing rural exports and generating new exports through organised production, sorting, grading, packaging, value addition & formal branding at village level. In order to galvanise export supply development we have to first create strong rural producer's institutions like EXPORT PRODUCTION VILLAGES to help establish direct links between the producers and the exporters, ensuring proper quality control and coordinating efficient delivery of

required inputs and outputs/ of export items, training and sustaining the continuous motivation, participation of all the concerned partners.

The Export Production Villages (EPVs) in Sri Lanka were a concept introduced in the 1970s to promote export-oriented production, primarily focusing on agricultural products, but also including non-agricultural and cottage industries.

The Main Objectives of Epvs were:

1. Export promotion: Increase export earnings through diversified products.
2. Rural development: Create employment opportunities and improve living standards in rural areas.
3. Value addition: Encourage value addition to primary products through processing, packaging, and other forms of value addition.

EPVs were designed to promote the production and export of various products, including:

1. Agricultural products: Fruits, vegetables, spices, tea, rubber, and other crops.
2. Value-added agricultural products: Processed foods, such as canned fruits and vegetables, spices, and tea packs.
3. Non-agricultural products: Handicrafts, textiles, garments, and other cottage industries.
4. Manufactured products: Small-scale manufacturing, such as furniture, metalwork, and other light engineering products.

The EPV concept aimed to create self-contained villages with necessary infrastructure, services, and support systems to facilitate export production. These villages were expected to become hubs for entrepreneurial activity, innovation, and job creation, contributing to Sri Lanka's economic growth and development.

While the EPV concept had potential, its implementation faced challenges, and the program's impact was not as significant as expected. However, the idea of promoting export-oriented production villages remains relevant, and similar initiatives have been implemented in other countries, with varying degrees of success. However it should not be forgotten that even during the 30 years long CIVIL WAR in Sri Lanka, their economy didn't collapse, one of the main reasons behind this was the foreign exchange earnings earned through the aegis of the EPVs.

And now Sri Lanka is establishing 5000 EXPORT PRODUCTION VILLAGES and the World Bank has already sanctioned the required finance for this innovative project.

With a new aggressive approach to self-reliant rural development Sri Lanka had started the EPV scheme during the eighties to provide advisory services to facilitate product development and market development as well as supply chain management in rural areas. And now they are replicating their own success story albeit on a gigantic scale!

However, while proceeding ahead in our country, studies will have to be undertaken to ascertain the causes why some of the SRI LANKAN tEPVs did not do well or folded up over a period of time.This study will be the best way to avoid costly mistakes. Also we will have to take inspiration from the success stories of the Netherlands, Israel, Vietnam, China, Brazil, Malaysia and also Kenya for fine-tuning our approach to Export Oriented rural development.

We in India urgently need to adopt this highly successful scheme for the following reasons:

*For Expanding our international export market for Agricultural, Horticultural and Marine Products.

*For promoting agri and horticultural produce, food products that are native, novel, ethnic and organic and which can be competitively sold especially in countries having Indian diaspora.

*To stipulate a mechanism that eases the flow of goods, promotes market access, and is helpful in overcoming the internal and overseas barricades, hygienic and phytosanitary processes.

*It will be highly beneficial to our farmers / rural brethren to come out of the DEBT TRAPs.

* It will help increase India's agricultural exports and non-agricultural value added products, local crafts/ cottage industries-etc, tremendously by participating in the universal value chain & boost up our GDP with forex earnings tremendously.

(The above aims are commensurate with the Government of India's policies for village oriented industrial products also. i.e. OVOP Projects already implemented)

With technical and monetary help from the government and philanthropic organizations, the village economy can be substantially improved by helping the farmers/ FPOs / & SFG's to identify produce or value added products which are having sustained demand and further on, to take up export activities.

FIRSTLY for this a new type of mother organization (AGRI ECONOMIC DEVELOPMENT CORPORATIONS IN ALL THE STATES OF INDIA - AEDC) will have to be set up which will act as a chief advisor go between link to collect the related information from the exporters based in India and importers outside the country, find out the types of products required by them, the quality/ quantity and the codes which they should satisfy.

SECONDLY this mother organization (AEDC) will get in touch with the rural communities and after having good interactive sessions, help them to set up EPV Companies & or Cooperatives.

THIRDLY this will help to empower the EPVs with trained technical experts (on deputation of two years) so that they can overcome the initial bottlenecks and hurdles in scheduling deliveries and help establish the protocols to meet the challenges to improve productivity, change the value chain structure, provide market access through mandatory labelling/ packaging and reach thousands of households in India and abroad.

viii. Simplify Regulatory Frameworks

Streamlining policies and regulations to reduce bureaucratic hurdles and encourage private investment in agriculture. That include Complex and restrictive certification standards; Inadequate support for small scale farmers; Regulatory frameworks that lack transparency and consistency that create confusion and uncertainty.

ix. Invest in Agricultural Research

Enhancing research and development in agriculture to improve crop yields, disease resistance, and water efficiency.

x. Promote Sustainable Practices

Encouraging farmers to adopt sustainable practices, such as organic farming and conservation agriculture, to reduce environmental degradation.

xi. Focus on Market-Oriented Production

By focusing on Market Oriented production, farmers can

- diversify their crops and grow that is in demand. This will reduce reliance on traditional crops.
- Improve quality and grading of produce to meet market standards.
- Access better markets to connect with buyers, processors, and exporters to get better prices.
- increase their income by adopting above agricultural practices.

Benefits of a Proper Transit Systems:

The lack of proper transit systems in Maharashtra, particularly in the Marathwada region, has indeed been a major bottleneck in agricultural produce marketing. This has resulted in:

1. **Increased wastage:** Perishable produce often spoils during transportation due to inadequate infrastructure.
2. **Reduced farmers' income:** Farmers are forced to sell their produce at lower prices due to the lack of efficient transportation options.
3. **Wastage of scarce resources:** The existing transportation infrastructure is often underutilized or inefficient, leading to wastage of resources.
4. **Negative impact on national wealth:** The agricultural sector's potential is not fully realized due to these transportation challenges, affecting the country's overall economic growth.

The proposed rail-cum-road freight corridor FROM Bhusawal-Aurangabad-Ahilyanagar-PuneTORoha-Konkan Rail /Road could be a game-changer for farmers and rural communities, especially in the Marathwada region. (Where nearly 8 farmers commit suicides every day) This corridor would:

1. **Improve connectivity:** Enhance transportation links between production centers and consumption hubs.
2. **Reduce transportation costs:** Lower costs would increase farmers' profitability and competitiveness.
3. **Increase efficiency:** Faster and more reliable transportation would reduce wastage and improve the overall supply chain.
4. **Boost economic growth:** By improving the agricultural sector's efficiency and competitiveness, the corridor would contribute to regional economic growth.

To make this vision a reality, it's essential to:

1. **Conduct feasibility studies:** Assess the technical, financial, and environmental viability of the proposed corridor.
2. **Engage stakeholders:** Involve farmers, rural communities, and other stakeholders in the planning and implementation process.
3. **Secure funding:** Explore funding options, including public-private partnerships, to support the corridor's development.

4. **Ensure sustainable operations:** Implement environmentally friendly and socially responsible practices throughout the corridor's operation.

By addressing the transportation challenges faced by farmers in Maharashtra, the proposed rail-cum-road freight corridor has the potential to transform the lives of rural communities and contribute to the region's economic growth, and help reduce the incidence of farmers suicides.

By supporting farmers in this way, the government can reduce its reliance on MSP, which can be a costly and inefficient way to support farmers. Instead, the focus can shift to enabling farmers to respond to market signals, innovate, and thrive in a more dynamic and competitive agricultural sector.

5. CONCLUSION

Concluding, it can be said that effective implementation of above-mentioned steps can transform the agricultural sector, making it more efficient, productive, and profitable and also help to reduce wastages.

Improving the food and agriculture sector can have a profoundly positive impact on all stakeholders, including:

- **Farmers:** Increased income, improved productivity, and better market access.
- **Fishermen:** Enhanced livelihoods, improved fishing practices, and increased market demand.
- **Tribals:** Empowerment, preservation of traditional knowledge, and improved access to markets.
- **Consumers:** Access to nutritious, safe, and affordable food, improved food security, and increased awareness about sustainable agriculture practices.

Feminization of Agriculture in India

Abstract

The present study attempts to delve into an important, dimension of agriculture in India, that is the growing feminization of agriculture. The root of this shift lies in the changing labour markets that pull men out of agriculture, thereby increasing the role of women. A peek into the data however reveals that women are majorly self-employed or engaged in subsidiary activities. Among the states, West Bengal has registered the highest feminisation during the period 2017-2024. Distinct spatial patterns are evident among the states. Migration of rural men to urban areas in search of gainful employment can be a likely cause. Additionally, on an average the lower per-capita income states seem to be registering higher feminisation.

Key words: Feminisation, migration, Spatial patterns, per capita income.

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1. Introduction

The Union Budget 2025-26 under its umbrella theme of "Sabka Vikas" seeks to achieve both rapid and inclusive economic growth. The key themes of the budget include Garib (poor), Yuva (youth), Annadata (farmers), and Nari (women). Agriculture has been a focal point of past budgets with objectives of increasing productivity and doubling farmer income. An important dimension is the large and growing presence of female farmers, workers and labourers engaged in agriculture and allied sectors and reflects the feminization of agriculture. The root of this shift lies in the changing labour markets

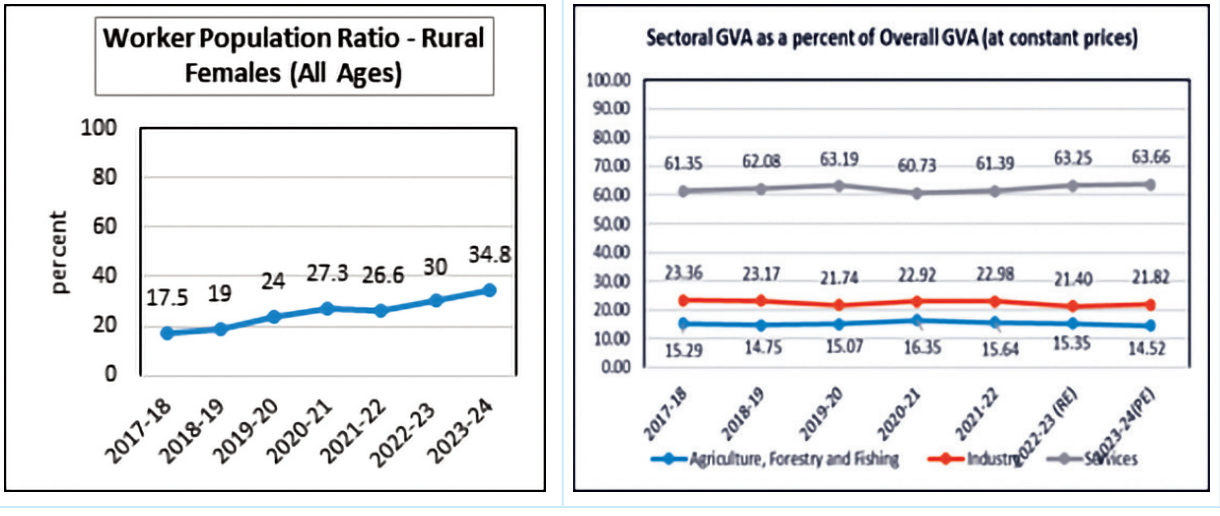
that pull men out of agriculture, thereby increasing the role of women. A number of studies have attributed the shift to the large-scale migration of rural men to urban areas (54.8% of total migrants, according to PLFS, Migration of India 2020-21) in order to mitigate the impact of the growing distress in agriculture. The increase in the role of women is evident from the multiple roles of women as cultivators, entrepreneurs, and labourers (Economic Survey 2018-19).

Against this backdrop, it is of interest to note that the sectoral share of agriculture and allied activities (includes forestry and fishing) in GVA at constant prices has been in the range of 14-15 percent over the last seven years from 2017-18 to 2023-24 whereas there has been a steady increase in the rural female worker population ratio[1] (WPR). The rural female WPR has almost doubled over the same period from 17.5 percent to 34.8 percent in 2023-24 and this increase in the rural female WPR is a pointer to the growing feminization of agriculture in the country. The National Industrial Classification (NIC) 2008 classifies various sectoral activities under 13 major divisions and the with a sub-classification of activities within each division by a unique code. This paper uses NIC 2008 for agriculture and allied sector to highlight the extent of feminization of agriculture and related activities in the country. The agriculture and allied activities sector has three main sub-divisions namely, Division 01 - crop and animal production, hunting and related service, Division 02 - forestry and logging and Division 03 -fishing and aquaculture.

2. National Level Analysis

An examination of the percentage of rural male and female workers in each of these divisions (ref. Figure 1) highlights the substantial and higher than rural males engagement of rural females in crop and animal production etc as compared to forestry & logging and fishing & aquaculture. With rapid increase in feminisation of agriculture it is necessary to evaluate the nature of engagement of the rural females in industry Division A. We therefore delve deeper into the occupational distribution of the rural women who are engaged in Agriculture and Allied Activities.

Figure 1: Sectoral GVA as Percent of Overall GVA and WPR



Source: RBI, Handbook of Statistics on Indian Economy, PLFS Annual Reports and Authors' calculations

1 WPR = (Number of Persons Employed/Total Population) ×100

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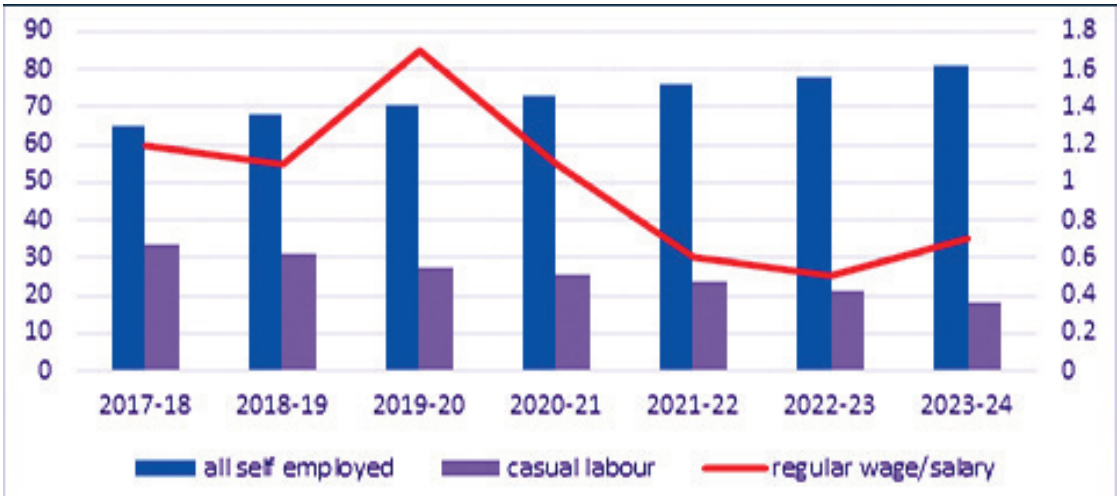


Figure 2. Percentage distribution of usually working rural women in usual status (ps+ss) by broad status in industry Division A

Figure 2 shows the percentage of women employed under the regular wage category is measured on the secondary axis and the percentage of women who are self employed and casual labour have been measured on the primary axis. A deeper peek into the nature of employment of rural female workers clearly reveals that there has been a 24.47 percentage point rise in the self-employed women in Division A during 2017-18 to 2023-24 or a CAGR of 3.175%. This has been compensated by a 41.66% fall in regular wage/salary employment (CAGR of -7.41%) and 45.56% decline in employment as casual labour (CAGR of -8.32%) during the same period.

Within the self-employed rural women in industry Division A, more than 50% of the women serve as helpers in household enterprises. The share of own account worker, employer is gradually rising, but has always been below the share of helpers. It is however interesting to note that the share of own account worker, employer witnessed a CAGR of 9.053% during 2017-18 to 2023-24 (Figure 3).

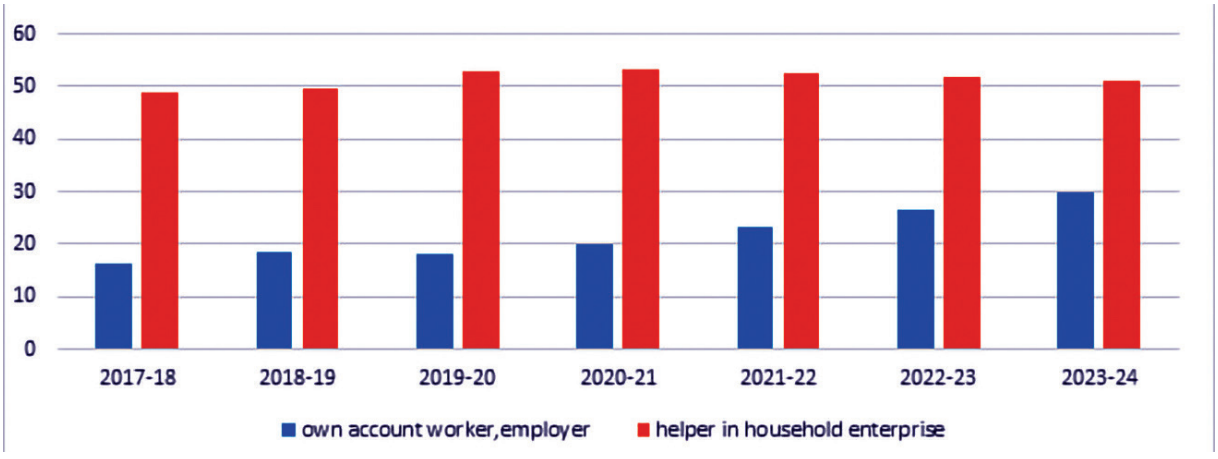
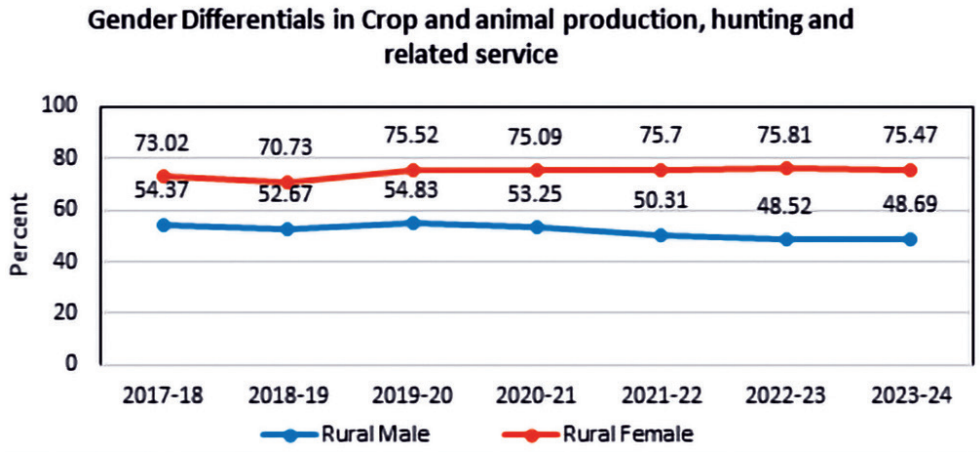


Figure 3: Percentage distribution of usually working rural self employed women in usual status (ps+ss) in industry Division A

A within Division A peek into the engagement of women in agriculture and allied activities, viewed in terms of gender differentials, reinforces the argument of the feminization of agriculture and can be observed from Figures 4 and 5. Figure 4 clearly shows that over the period 2017-18 to 2023-24, the percentage of rural females engaged in crop and animal production etc. has been nearly 18 - 20 percentage points higher than rural males.

Figure 4: Gender Differential in Crop and animal Production, hunting and related service



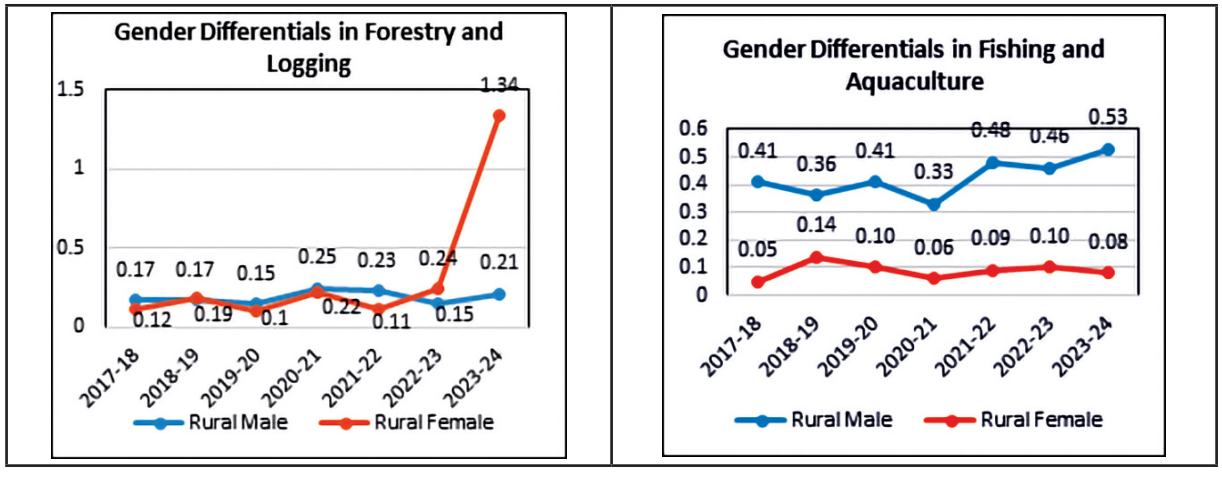
Source: PLFS Annual Report (Various Issues)

The gender gap was 18.65 percentage points in 2017-18 and has subsequently widened to 26.78 percentage points – an increase of 8.13 percentage points over the 7 year period. Interestingly, this gender gap is biased in favour of females. This increase in the gender gap can be attributed to both a steady increase of rural female participation which has increased by 2.45 percentage points and a decline of rural male participation by 5.68 percentage points. Hence it is evident that feminization of agriculture can be attributed primarily to the withdrawal of rural males from crop and animal production etc.

An examination of the percentage of rural males and females engaged in forestry and logging (Division 02) and fishing and aquaculture (Division 03) points to a very small percentage (less than 1 percent) of rural persons (male and female) engaged in these occupations.

It can be observed from Figure 5 below, that engagement of rural females in forestry and logging is not very different from that of rural males whereas in fishing and aquaculture the presence of rural males is substantial compared to rural females , albeit both these divisions showing a very small percentage of engagement by both males and females in rural areas. It can also be observe that in 2023-24 there was a substantial rise in the percentage of rural females getting involved in forestry and logging. The gender gap in Division 3 seems to be rising in recent years, given the male dominated nature of activities undertaken under this division.

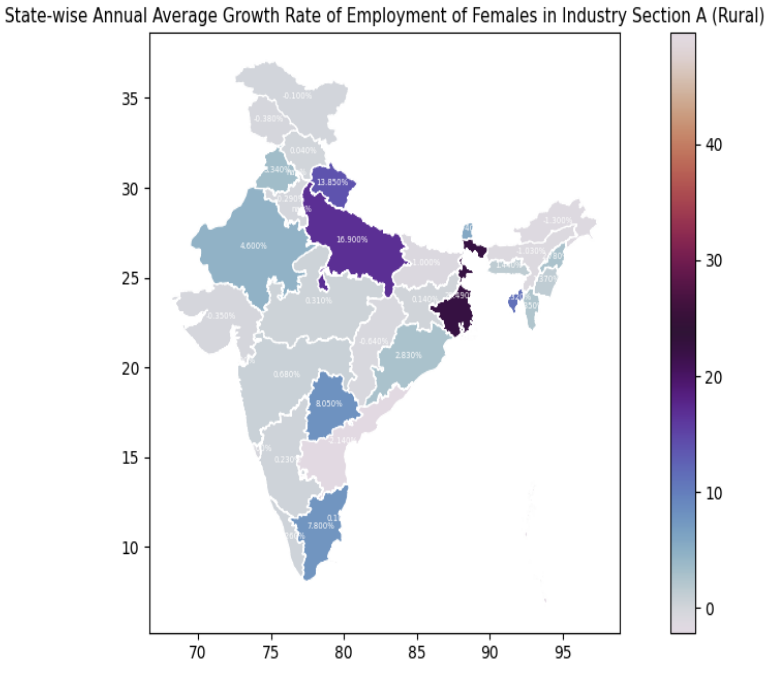
Figure 5: Gender Gap: Division 2 and Division 3



Source: PLFS Annual Report (Various Issues)

3. State Level Analysis

A State-wise analysis covering 28 States (Ref. statewise heat the Map of India given below) shows that the growth rate of rural females engaged in agriculture and allied activities (Division A of the NIC 2008) is lower than the All-India growth in half of the States considered (14 of the 28 States) and within these 14 States the percentage growth of females in rural areas engaged in agriculture and allied activities has been declining in 8 States. Spatial effects are clearly evident between States that have growth rates higher/ lower than the All-India average.



West Bengal tops the list with the highest annual average growth rate of rural women in agriculture at 22.49% closely followed by Uttar Pradesh, Uttarakhand, Tripura and Rajasthan that registered double digit growth rates during 2017-2024. A major proportion of feminisation is evident in the northern states, from where interstate migration of rural men is increasing. Among the southern states, Telangana and Tamil Nadu registered very high growth rates, while West Bengal and Tripura dominated the eastern and north eastern states. Among the Western states Rajasthan recorded the highest growth rate.

4. Conclusion

It can thus be concluded that feminisation of agriculture is distinctly evident in India. However, women are majorly self employed and engaged in subsidiary activities. Among the states, West Bengal has registered the highest feminisation during the period 2017-2024. Distinct spatial patterns are evident among the states. Migration of rural men to urban areas in search of gainful employment can be a likely cause. Additionally, on an average the lower percapita income states seem to be registering higher feminisation.

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Trends and Patterns in Agriculture Credit: A Study on Utilisation of Credit by Marginal Farmers in Nadia District of West Bengal

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Abstract:

This study explores the utilization of agricultural credit by marginal farmers in Nadia District, West Bengal, with a focus on understanding the trends and patterns in credit access, usage, and its impact on agricultural productivity and livelihoods. Agriculture credit plays a pivotal role in supporting small-scale farming by providing financial resources for investment in inputs, equipment, and modern technologies. The research examines the various institutional mechanisms facilitating access to credit, including cooperative banks, PACS, Kisan Credit Cards, and government schemes like "Amar Fasal Amar Gola." Primary data was collected from 50 marginal agricultural households across two villages, Muragacha and Birpara, to assess the relationship between credit utilization and factors such as income, operational land size, and cropping patterns. The study identifies key challenges faced by farmers, including access to credit, high interest rates, insufficient documentation, and the dominance of informal lending. Despite these challenges, access to credit has positively impacted productivity, enhanced livelihoods, and promoted financial inclusion. The paper concludes with recommendations to streamline credit access, enhance financial literacy, and address regional disparities to ensure more equitable access to agricultural credit. By fostering

inclusive credit systems, the study suggests, West Bengal can achieve sustainable agricultural development and improve the financial well-being of marginal farmers.

Keywords: Agricultural Credit, Marginal Farmers, Credit Utilization, Institutional Credit.

Introduction

Overview of Agriculture Credit

Agriculture credit plays a crucial role in supporting the growth and development of the agricultural sector. It provides farmers with the financial resources they need to invest in equipment, seeds, and other inputs that are essential for increasing productivity and improving crop yields. In this paragraph, we will delve deeper into the various types of agriculture credit available to farmers and the impact it has on their livelihoods.

Agriculture credit can come in many forms, including loans, grants, and subsidies. These financial resources help farmers not only to sustain their operations but also to expand and innovate. By providing access to credit, farmers are able to take risks, try new techniques, and adopt sustainable practices that can lead to long-term success. Ultimately, agriculture credit is a lifeline for farmers, ensuring their ability to continue producing food for the world.

For example, a farmer in a developing country may receive a low-interest loan to invest in irrigation systems, allowing them to increase their crop yields and improve food security within their community. This access to credit can help break the cycle of poverty and create opportunities for economic growth in rural areas.

On the other hand, if the farmer is unable to repay the loan due to unforeseen circumstances such as a natural disaster or crop failure, they may face increased debt and financial instability. This could ultimately lead to the loss of their farm and further exacerbate poverty within their community.

While access to credit can provide opportunities for economic growth, the risk of increased debt and financial instability in the event of unforeseen circumstances should not be overlooked. Without proper risk management strategies in place, the potential benefits of low-interest loans may be outweighed by the negative consequences of defaulting on repayment.

Importance of Credit for Marginal Farmers

In order to mitigate the risks associated with borrowing money, it is essential for marginal farmers to have a comprehensive understanding of their financial situation and a plan for how they will repay their loans. This includes conducting thorough financial assessments, developing realistic repayment schedules, and seeking out financial education and support services. By taking proactive steps to manage their credit effectively, marginal farmers can better position themselves to take advantage of the benefits that access to credit can provide, while also minimizing the potential negative impacts of debt and financial instability.

It is also important for marginal farmers to explore alternative sources of funding, such as grants or subsidies, in order to reduce their reliance on loans. Additionally, maintaining open communication with lenders and seeking assistance if they face difficulties in repaying their loans can help prevent financial crises and improve their overall financial health. With careful planning and proactive financial management, marginal farmers can create a sustainable path towards financial stability and success in their agricultural endeavours.

For example, a marginal farmer who has diversified their income streams by incorporating agro-tourism

activities on their farm may be less impacted by fluctuations in crop prices or yields. By accessing grants to invest in infrastructure for their agro-tourism venture, they can reduce their need for loans and increase their overall financial stability. By regularly reviewing their financial situation and seeking advice from a financial advisor, the farmer can proactively address any potential issues before they escalate into a crisis.

However, this counterexample may not always hold true as agro-tourism activities can be highly dependent on external factors such as tourist preferences, weather conditions, and economic downturns. If the farmer's agro-tourism venture is not well-received or experiences a decline in visitors, they may still face financial instability despite their efforts to diversify their income streams. Additionally, relying on grants for infrastructure investments may not always be sustainable in the long run, as grant funding can be inconsistent and unreliable.

While agro tourism can diversify income streams, it is not a guaranteed solution to financial instability for farmers. External factors beyond their control can still impact the success of their venture. Additionally, relying on grants for infrastructure investments may not be a sustainable long-term strategy due to the inconsistency of grant funding.

Materials and Methods

This study focuses on the use of credit in productive purposes by marginal agricultural households in two villages, Muragacha and Birpara, in the Nadia district of West Bengal. Out of 122 marginal agricultural households, 50 were selected using Simple Random Sampling Without Replacement. Primary data was collected through surveys on operational holding size, land area under various crops, annual income, family size, source-wise credit taken, and credit used for various purposes. Variables such as size of operational holding, annual income earned from off-farm sources, gross cropped area under non-cereal crops, per capita income, and number of crops were considered to determine their effect on credit use. The sample households were categorized into three groups based on annual income: low-income group (low income group), medium income group (medium income group), and high income group (high income group). The study was conducted from 2011-2012.

Results and Discussions

Agricultural credit in West Bengal is crucial for bolstering the state's agrarian economy, which is marked by small-scale farming and a variety of cropping systems. Timely and affordable access to credit allows farmers to invest in necessary inputs, embrace modern technologies, and improve their productivity.

Key Institutions and Schemes

1. **West Bengal State Co-operative Bank (WBSCB):** Founded in 1918, WBSCB functions as the leading cooperative bank in the state, specializing in short-term agricultural loans and supervising district cooperative banks and primary agricultural credit societies (PACS). The bank provides a range of services, including locker facilities, bank guarantees, and diverse loan schemes designed to assist farmers.
2. **Primary Agricultural Credit Societies (PACS):** PACS, or Primary Agricultural Credit Societies, function at the grassroots level as cooperative organizations that offer financial services to farmers, such as loans for crop production and various agricultural endeavours. Recent statistics indicate that

West Bengal is home to around 7,405 PACS, showcasing a strong network for distributing rural credit.

3. **Kisan Credit Card (KCC) Scheme:** Introduced in 1998, the KCC scheme aims to meet the varied credit requirements of farmers. It provides short-term loans for crop cultivation and term loans for capital investments, including the purchase of livestock or equipment. Furthermore, KCC holders enjoy the added advantage of personal accident insurance, enhancing their financial protection.

4. **Credit Linked Subsidy Scheme for Custom Hiring Centres (CHC):** Initiated in 2014, this program supports rural entrepreneurs in setting up custom hiring centers for agricultural machinery. It provides financial aid and subsidies, allowing farmers to obtain modern equipment at lower costs, which enhances productivity and minimizes expenses.

5. **"Amar Fasal Amar Gola" Scheme:** This initiative provides direct financial support to farmers' bank accounts, particularly for those holding Kisan Credit Cards. The program aims to help farmers reduce their input costs and enhance their income.

6. **Policy Initiatives by NABARD:** The National Bank for Agriculture and Rural Development (NABARD) has set a credit target of ₹2.47 lakh crore for the priority sector in West Bengal for the fiscal year 2022-23, with around 39.32% of this amount designated for the agriculture sector. This initiative highlights a dedication to improving access to agricultural credit in the state.

Developments

In December 2024, the Reserve Bank of India raised the ceiling for collateral-free agricultural loans to ₹2 lakh, an increase from the previous limit of ₹1.6 lakh. This move is intended to enhance access to formal credit for small and marginal farmers, helping them cope with escalating input costs and inflationary challenges.

Challenges and Opportunities

Notwithstanding these initiatives, obstacles such as fragmented land ownership, insufficient market infrastructure, and the threats posed by climate change continue to exist. Tackling these challenges necessitates a comprehensive strategy that includes bolstering cooperative institutions, improving financial literacy among farmers, and facilitating access to insurance and risk management resources.

In conclusion, the agricultural credit framework in West Bengal is bolstered by a system of cooperative banks, credit societies, and government programs aimed at empowering farmers. Continuous policy initiatives and institutional backing are essential for addressing current challenges and promoting sustainable agricultural growth within the state.

Results and Discussion on Agricultural Credit in West Bengal

Agricultural Credit in West Bengal

Agricultural credit plays an essential role in fostering the growth and sustainability of the agricultural sector, particularly in West Bengal, where a significant portion of the population resides in rural areas and the economy is heavily reliant on agriculture. The importance of agricultural credit in boosting productivity, facilitating infrastructure development, and encouraging farm mechanization cannot be overstated. In West Bengal, agricultural credit is primarily extended through formal institutions, including Commercial Banks, Regional Rural Banks (RRBs), and Co-operative Banks, in addition to various government programs and microfinance initiatives.

Trends in Agricultural Credit in West Bengal

1. **Increase in Credit Disbursement:** In recent years, there has been a consistent rise in the availability of credit for farmers in West Bengal, largely influenced by various government initiatives, including interest subvention programs, direct benefit transfer mechanisms, and farmer welfare initiatives. The allocation of agricultural credit has been progressively increasing, particularly in the areas of crop loans and agricultural infrastructure development.
2. **Loan Accessibility:** Despite the improvements, access to agricultural credit remains a significant hurdle for a considerable segment of the rural population in West Bengal, particularly among small and marginal farmers. This challenge is primarily attributed to factors such as insufficient documentation, low credit ratings, and a lack of financial literacy among rural borrowers.
3. **Government Initiatives and Schemes:** Numerous programs, including the Kisan Credit Card (KCC), Pradhan Mantri Fasal Bima Yojana (PMFBY), and institutional credit frameworks, have been instrumental in enhancing credit accessibility for farmers. Additionally, the state government has been actively promoting micro-credit through Self Help Groups (SHGs) to extend services to remote and underserved regions.

Challenges in Agricultural Credit Distribution

1. **Credit Deficiency:** Despite a growing influx of institutional credit, a notable credit deficiency persists within the agricultural sector. Small and marginal farmers frequently encounter obstacles in obtaining institutional credit due to rigorous eligibility requirements, insufficient collateral, and occasionally complex documentation processes.
2. **Excessive Interest Rates:** Although numerous programs provide subsidized credit, some farmers are still forced to seek assistance from informal credit sources, such as moneylenders, who impose exorbitant interest rates. The disparity between formal and informal credit systems continues to pose a significant challenge.
3. **Geographical Inequities:** The allocation of agricultural credit in West Bengal is inconsistent, with a greater emphasis placed on regions that possess superior infrastructure and heightened credit demand. Rural and isolated areas continue to struggle with obtaining timely and sufficient credit.
4. **Prolonged Disbursements and Administrative Hurdles:** Farmers often experience delays in loan disbursement, particularly from government initiatives. Such delays can result in missed planting seasons and other agricultural challenges.

Impact of Agricultural Credit:

1. **Enhanced Productivity:** The availability of timely credit has enabled farmers within the state to adopt modern agricultural practices and invest in essential inputs such as seeds, fertilizers, pesticides, and machinery. This has resulted in a notable increase in agricultural productivity, especially in the cultivation of rice, vegetables, and fish farming.
2. **Improved Livelihoods:** Agricultural credit has played a crucial role in enhancing the livelihoods of farmers by allowing them to diversify their income streams and fostering the growth of related sectors, including dairy farming, poultry, and aquaculture.
3. **Financial Inclusion:** Initiatives such as the Kisan Credit Card have made significant strides in promoting financial inclusion, leading to a greater number of farmers obtaining institutional credit instead of depending on informal lending sources.

Recommendations for Enhancing Agricultural Credit in West Bengal

1. **Facilitating Credit Accessibility:** Streamlining the loan application process and minimizing documentation requirements can significantly aid farmers, particularly smallholders, in obtaining credit with greater ease.
2. **Education and Financial Awareness:** Promoting knowledge of existing credit programs and enhancing financial literacy will enable farmers to utilize credit more effectively and steer clear of debt pitfalls.
3. **Specialized Credit for Smallholders:** Tailored credit solutions should be developed specifically for small and marginal farmers, who constitute the majority of the agricultural workforce in West Bengal. These solutions ought to offer flexibility regarding loan amounts, repayment terms, and collateral demands.
4. **Development of Infrastructure:** Improving the rural banking framework and establishing additional credit access points in remote regions will ensure that farmers can more readily access financial services.
5. **Collaboration with the Private Sector:** Fostering partnerships with private banks to broaden their agricultural credit initiatives could help close the credit access gap, particularly in areas that are currently underserved.

Conclusion

Agricultural credit in West Bengal has played a crucial role in enhancing agricultural productivity and elevating the living standards of rural communities. Despite the advancements made, issues such as regional inequalities, gaps in credit availability, and the dominance of informal lending practices continue to exist. By tackling these issues and prioritizing inclusive and targeted credit distribution, the state can foster more sustainable agricultural growth and further its objectives for rural development.

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Role of NABARD in Village Development

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Abstract:

This article explores the crucial role of the National Bank for Agriculture and Rural Development (NABARD) in fostering rural development across India, with a particular emphasis on its impact on village development. India's villages, home to 68% of the population, rely heavily on agriculture and natural resources for their livelihoods. However, underutilization of these resources has hindered rural growth. Established in 1982, NABARD was tasked with promoting sustainable agriculture and rural prosperity. The article highlights NABARD's major functions, including financial support, developmental initiatives, and supervision, as well as its significant schemes aimed at agricultural and non-farm sector development, microfinance, skill development, and research. Notable schemes such as the SHG Bank Linkage Project, Kisan Credit Card, and Watershed Development Program have had a profound impact on rural communities. The article concludes by stressing the importance of collaboration between professional organizations, like the CMA fraternity, and NABARD to amplify the success of these initiatives, ultimately leading to a stronger and more self-sustained rural India.

Keywords: Village Development, NABARD Schemes, Institutional Development

Introduction:

"India lives in its villages" is not merely a statement but a fact of this country, where 68% population lives in villages and 58% are dependent on agriculture as a primary source of income. It is interesting to note that each and every region that is a cluster of villages is a unique place to live due to factors like varied soil, weather conditions, and available natural resources. Due to its varied natural conditions, every region has a variety of crops that lead to different food habits, delicacies, festivals, culture etc.

Indian villages are usually dependent on natural resources that include agricultural resources, forest resources, timber, minerals, rivers, lakes, etc. The utilization of these resources depend on the regional infrastructure that includes transportation facilities, telecommunication, housing, schools, health centers, work opportunities from non-farm-based industries, markets, technology, banking, and other institutional support, etc. The development of villages largely depends on the utilization of available resources.

Due to various factors, resources available to villages remained underutilized or mis utilized that has decelerated the pace of rural development in the country, during initial years after independence. During

late 1970s, it was realized that to have a developed India, you need to develop its villages. Thought of rural development took shape and with this core thought in the background, NABARD came into existence on 12 July 1982, by an act of parliament to promote sustainable and equitable agriculture and rural development to foster rural prosperity by transferring the agricultural credit functions of RBI.

Major Functions

Initiatives of NABARD are aimed at building an empowered and financially inclusive rural India through specific goal-oriented departments which can be categorized broadly into three heads viz. Financial, Developmental and Supervision

Through these initiatives almost every aspect of the rural economy is covered, from providing refinance support to building rural infrastructure; from preparing district-level credit plans to guiding and motivating the banking industry in achieving these targets; from supervising Cooperative Banks and Regional Rural Banks (RRBs) to helping them develop sound banking practices and on boarding them to the CBS platform; from designing new development schemes to the implementation of Government of India's development schemes; from training handicraft artisans to providing them with a marketing platform for selling these articles.

Over the years NABARD initiatives have touched the lives of millions of rural habitants across the country. There is a long list of the milestones achieved by NABARD so far. Some of these are:

- The SHG Bank Linkage Project launched by NABARD in 1992 has blossomed into the world's largest microfinance project.
- Kisan Credit Card, designed by NABARD has become a source of comfort for millions of farmers. Its limit has been raised to ₹.5.00 lakhs in this union budget 2025-26.
- It has financed one-fifth of India's total rural infrastructure.
- It pioneered the watershed development project as a tool for sustainable climate-proofing.

To have a basic understanding of major functions of NABARD, we can look at Figure below:

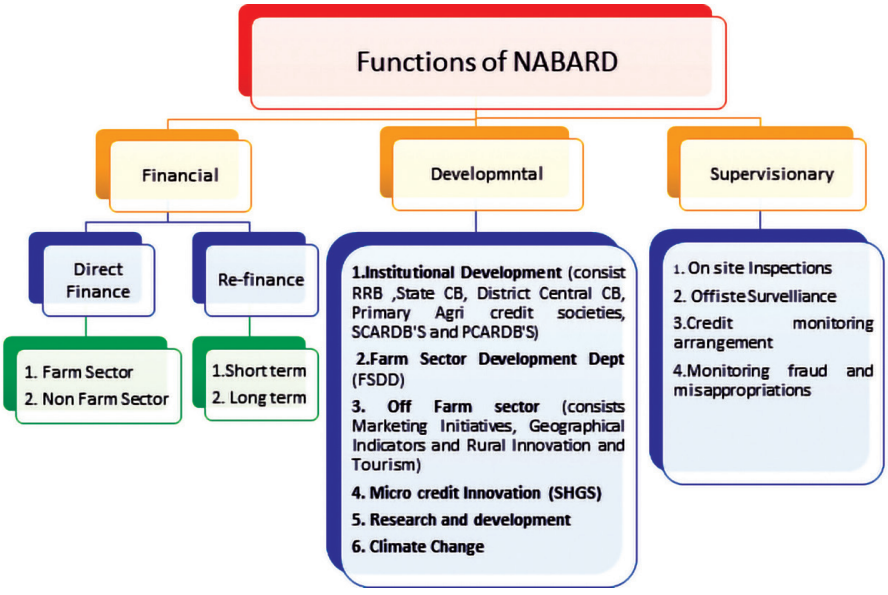

Figure 1: Functions of NABARD

Schemes of NABARD

The primary objective of NABARD is to promote sustainable and equitable agriculture and rural development through institutional development, credit support, and other related services. To meet these objectives, under the vast umbrella of its four functions NABARD has launched various schemes to support variety of activities for a large number of beneficiaries from different segments of rural backgrounds. These schemes can be broadly classified into 4 segments as shown in Figure 2 below:

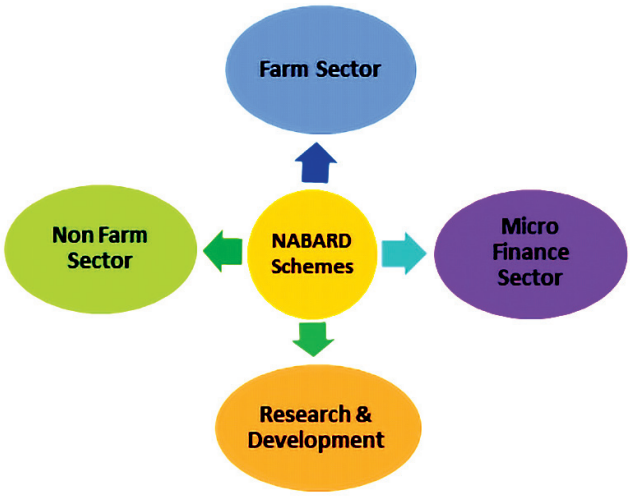

Figure 2: Classification of NABARD Schemes

A. Farm Sector Schemes:

These are government-sponsored initiatives and programs designed to support and promote the agricultural sector. These schemes aim to enhance agricultural productivity, increase farmers' income, improve rural livelihoods, and address various challenges in the agricultural sector. Farm sector schemes can encompass a wide range of activities and initiatives. Farm sector schemes basically consist of various programs, detailed below:

i. Producers Organisation Development Fund (PODF)

NABARD has taken the initiative to support producer organizations (POs), adopting a flexible approach to meet the needs of producers. Beneficiaries include registered Producer Organisation viz. FPOs (Farmer Producer Companies), Producers Cooperatives, registered Farmer Federations, MACS (Mutually Aided Cooperative Society), industrial cooperative societies, PACS (Primary Agricultural Cooperative Societies) etc. Support under PODF is provided as follows:

(a) Loan-linked grant support is available to the FPOs for promotion, capacity building & market interventions.

(b) Grant assistance to eligible agencies for conducting workshops, meetings, round table meetings, special studies, IT-based interventions, etc. is also available without linking to availing institutional loan.

ii. Watershed Development Program

Watershed Development Fund (WDF) was created in 1999-00 with broad objectives of unification of multiplicity of watershed development programmes into a single national initiative through

involvement of village level institutions and Project Facilitating Agencies (PFAs). This program has helped the farmers in the form of improved soil, improved water table of the region, and decrease in seasonal migration. A midterm evaluation of program is carried out in various states and it has confirmed better availability of potable water and increase in crop intensity. All this has contributed towards the improved the quality of life of rural dwellers.

iii. Tribal Development Program

Tribal Development Fund (TDF) was created in the year 2003-04 with a special emphasis on providing support for holistic development of tribal communities. As on 31 March 2020, 791 Tribal Development Projects are being implemented with a cumulative sanction of ₹.2302.29 crore. These projects are implemented across 29 States and Union Territories, covering 5.53 lakh tribal families which spread over 4.54 acre of land.

B. Non-Farm Sector Schemes:

These are promoted with a view to reduce over dependence of rural India on agriculture by providing alternate livelihood options and thereby curbing large-scale migration of small and marginal farmers and agricultural labourers to urban areas. These schemes include marketing support of non-farm products, skill development, innovation, housing and sanitation for the rural population. Details of these schemes are as below:

i. Marketing Initiatives

Financial assistance by way of grant is provided on selective basis, to enable the artisans to sell the products in marketing events. This also enables them to benefit directly from the market feedback for better future value realization.

ii. Exhibition/ Fairs

NABARD supports and provides marketing platform to rural artisans and producers to exhibit their traditional art crafts, produce and products through exhibitions and fairs. This helps the artisans in utilizing their expertise as source of livelihood and also help them in enhancing their income.

iii. Rural Haats/Rural Marts

NABARD has extended financial assistance by way of grant for setting up of Rural Marts. This helps artisans and producers to market their products at a fixed place without incurring any cost. This provides direct market and ready customers to rural masses.

iv. Skill development RUDSETI / RUDSETI Type of Institutions / RSETIs

As an effort to institutionalize the Entrepreneurship and Skill Development initiatives, NABARD provides support to specialised institutions viz., RUDSETI (Rural Development and Employment Training Institute) /RUDSETI type of Institutions, which provide entrepreneurship development training to rural youth/women on various skills, which can generate better livelihood options. Assistance is provided to these institutions, which comply with the criteria stipulated by NABARD.

In order to broad base the skill initiatives, in addition to RSETI/RUDSETI, new set of partner agencies i.e. training institutes affiliated with NSDC (National Skill Development Corporation), Government agencies, Corporates under CSR, NGOs, Trusts and other voluntary agencies etc. have been included so as to cover the skill requirements of different segments of society.

v. Rural Innovation Fund (RIF)

Rural Innovation Fund (RIF) is a fund designed to support innovative, risk-friendly, unconventional experiments in farm, off-farm and microfinance sectors that would have the potential to promote livelihood opportunities and employment in rural areas.

Support available under RIF can be in the form of loan/grant/ incubation fund support, or a mix of all the three components. The support is designed to be need-based, cost effective and dependent on the requirement of the project, also taking into account some financial involvement by the proposer. This is decided on a case-to-case basis. "On completion of the tenure of RIF on 30 September 2014, the fund ceased to exist. However, NABARD continues to support rural innovations".

vi. Support to Rural Housing and Rural Sanitation

NABARD is extending financial assistance for rural housing and sanitation to the eligible institutions.

C. Micro Finance Sector Schemes

NABARD, through its' Micro Credit Innovations Department has continued its role as the facilitator and mentor of microfinance initiatives in the country. The overall vision of the department is to facilitate sustained access to financial services for the unreached poor in rural areas through various microfinance innovations in a cost effective and sustainable manner.

i. Support for training and capacity building of clients for SHG-BL PROGRAM

Giving due recognition to training and capacity building of various stakeholders such as bankers, NGOs, Government officials, SHG members and trainers, NABARD has trained around 44.42 lakh participants from the Financial Inclusion Fund till 31 March 2022, in the process giving shape to a strong back up team for implementation of the program.

ii. Micro Enterprise Development Programme (MEDPs)

NABARD has been supporting need-based skill development programs (MEDPs) for matured SHGs that already have access to finance from Banks, since 2006. MEDPs are on-location skill development training programs that attempt to bridge the skill deficits or facilitate optimization of production activities already pursued by the SHG members. Grant is provided to eligible training institutions and Self Help Promotion Institutions (SHPIs) to provide skill development training in farm/off-farm/ service sector activities leading to establishment of micro enterprises either on individual basis or on group basis. Over the years around 5.47 lakh SHG members have been covered through 19,203 MEDPs as on 31 March 2022 with a total grant support of ₹44.46 crore.

iii. Livelihood and Enterprise Development Programs (LEDPs)

As skill upgradation trainings alone have limited impact on livelihood creation among the SHG members, it was thought prudent to create sustainable livelihoods among SHG members and to attain optimum benefit out of skill upgradation and a new scheme titled Livelihood and Enterprise Development Program (LEDP) was launched in December 2015. It envisages conduct of livelihood promotion programs in clusters covering 15 to 30 SHGs in a cluster of contiguous villages where from SHG members may be selected.

LEDP has been mainstreamed in May 2017. Cumulatively, 1.83 lakh SHG members have been supported through 1641 LEDPs as on March 31 2022, with a total grant support of ₹77.14 crore.

iv. **Scheme for promotion of Women Self Help Groups (WSHGs) in backward & Left Wing Extremism (LWE) affected districts of India**

The scheme aims at saturating the districts with viable and self-sustainable WSHGs by involving anchor agencies who shall promote & facilitate credit linkage of these groups with Banks, provide continuous handholding support, enable their journey to livelihoods and also take the responsibility for loan repayments. Under the Scheme, in addition to working as an SHPI, the anchor agencies are also expected to serve as a banking / business facilitator for the nodal implementing banks.

v. **Collaboration with NRLM**

NABARD continues close coordination with all stakeholders in SHG BLP (Bank Linkage Program) sector. Collaboration with NRLM (National Rural Livelihood Mission) is a poverty alleviation project implemented by the Ministry of Rural Development, Government of India.is being regularly maintained and enhanced for the support of SHG BLP. Coordinated efforts like conduct of National level seminars and workshops, mutual dialogues and capacity building of stakeholders on SHG BLP have now become very regular.

D. Research And Development

Established by the Bank, in accordance with the provisions of the NABARD Act 1981, the Research and Development (R&D) Fund aims at acquiring new insights into the problems of agricultural and rural development through in-depth studies and applied research and trying out innovative approaches backed up by technical and economic studies.

The R&D Fund is utilised for formulating policies on matters of importance to agricultural operations and rural development, including facilities for training, dissemination of information and promotion of research by undertaking techno-economic studies and other surveys in the fields of agriculture, rural banking and rural development.

Conclusion

NABARD has been working tirelessly for more than 4 decades towards the goal of the overall national growth and prosperity by keeping the farmer first. All its programs and schemes cover the entire rural population of the country having no bars of state, language, gender etc. Their growth has been remarkable and their commitment is visible in the statement of their Chairman"We remain committed to making a meaningful impact through partnerships, innovative solutions, and prudent financial stewardship. Together with our stakeholders, we envision a future where every rural household thrives and contributes to sustainable prosperity".

In my view, CMA fraternity and our Institute should think of joining hands with NABARD to make their various schemes a big success. There are many schemes like PODF, FPOs, skill development schemes etc. where CMAs can be instrumental in helping various stakeholders in achieving the targets and evaluation of the schemes from time to time. This partnership can be proved beneficial for all stake holders to make the rural India strong and developed. Then in real sense we will be able to say that 'the Soul of India lives in its villages'.

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Agriculture in India: Issues and Priorities

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Abstract

India now possesses significant experience regarding its agricultural and rural development strategy, aiming to address the concerns raised by policymakers who have let the population down. This paper combines historical analysis with empirical evidence to illuminate the agricultural sector's journey through seven growth phases. The first Prime Minister promised that 'everything else could wait, but agriculture' – a promise that remained unfulfilled during his lifetime and for several years thereafter. Even now, agriculture dictates the economy's fate; if it falters, overall growth declines, while a bountiful year for agriculture stimulates economic expansion. The unfortunate reality is that between 1991 and 2011, according to population censuses, five million farmers abandoned their profession in search of other opportunities. The proportion of small and marginal farmers is rising more rapidly than population growth, forcing economically vulnerable farmers to transition to the service sector. Consequently, the economy's structure increasingly favours the services sector, although this shift carries significant negative externalities. Growth in the agricultural sector has remained around 3 per cent. Liberalisation introduced powerful currents of commercialisation, leading the agricultural sector into trade with a positive trade surplus. However, neglect of crucial agricultural needs and commercialisation that benefits only resourceful farmers sparked severe distress, peaking by the end of the 1990s. Price fluctuations and market failures culminated in unprecedented agitation. The paper concludes that, as no long-term policy has been envisioned or established, we must seriously consider a sustainable long-term solution.

1. Introduction:

Agriculture is a vast activity supposedly under farmers' control, seemingly the primary decision-makers. Two important influencing factors dictate the process of decision-making. Essentially, the word agriculture incorporates culture; hence, the changing flow of culture influences the method and process of agriculture in any country. It is well known that agriculture is a profession adopted hereditarily by the farming community, and generations share the knowledge. The stock of knowledge in the family is also disseminated to the villagers, which determines the practice of agriculture. Culture, as we understand it, is a flow concept, and human behaviour draws the basic contours of any culture. It is not constant and, hence, monolithic.At the independence, our policymakers confronted the dilemma of inclusivity (then understood as equity or poverty removal) on the one hand and negotiating the immediate economic problems on the other. A mixed ideological path guided the political economy but had its externalities. There were a few advantages of following the

path of a mixed economy during those years when international politics was quite unpredictable (Chhotray, 2012). The two superpowers were trying to woe the new countries under their fold. The test was simple; it was either the capitalist mode of production on one side or the socialistic pattern of development on the other. Given the then socio-economic characteristics of independent India, which had just emerged under colonial rule, it was a wise decision to trade on the path of a mixed economy. It was certainly not a mistake, but the instruments that were put in use did not keep in view the refractory structure of the Indian economy at the time. The society was fragmented on the lines of class and social classes, and development schemes were insufficient to encompass the issues squarely. As a result, inequalities in terms of region and inter-personal income were widening.

A TRAVELOGUE IN STRATEGY

1950 to 1967: Nehruvian Era – Mixed economy/undecided path

1968 to 1976: Leaning Left – Poverty Issues and Weak Governance

1976 to 1985: Unstable Politics and Undecided Path – Plethora of Institutional Problems

1985 to 1999: Creating and Solving a Crisis - Maturing to Understand

2000 to 2013: Taking on the World - Undecided Paths and an Underprepared Task

Source: *Deshpande (2014)*

Policymakers have consistently emphasised inclusive development over the last six decades of development planning. Although the vocabulary has frequently shifted, the focus, at least in intentions, has remained on equity. During this period, the approach paper for the 11th five-year plan first introduced the term 'inclusive growth' into the planning lexicon. The development experience over these six decades has shown considerable variability. We can categorise the development experience into five broad phases. Our efforts towards inclusivity navigated through these phases with varying degrees of emphasis throughout this time. The initial phase commenced in 1950, marking the advent of planning, and was primarily influenced by Nehruvian policies. While equity was on the agenda, more urgent matters overshadowed it, including food distribution and economic growth. The promises made by the second and third five-year plans ultimately went unfulfilled, catching policymakers by surprise. During these formative years, 'inclusivity' was primarily pursued through job creation and the integration of backward regions, albeit with limited success. Additionally, the country faced two consecutive drought years (1965-67) and a costly war with Pakistan, further exacerbating the situation. The devastating results presented formidable challenges related to poverty and regional underdevelopment. Food availability plummeted, exacerbating the plight of the impoverished. Our Gandhian vision of inclusivity was dashed ("To serve our villages is to establish Swaraj. Everything is but an ideal dream," wrote Mahatma Gandhi in Young India, 26-12-1929). The entrenched social institutions and land relations also worsened the situation. Land reforms were introduced to promote equity in land asset distribution, as land was the most significant resource for rural production (Sinha & Pushpendra, 2000). However, these reforms progressed slowly due to the semi-feudal structure of society. Consequently, they failed to significantly impact the process of mitigating inequity. Inclusivity became abstract once more.

The two successive years of droughts and the well-fought battle with Pakistan brought difficult days for India. The country's Green Revolution was heralded, and the inherent technology was essentially cash-intensive. The technology rested on new seeds, fertilisers, irrigation water, and substantial input on extension—these required cash resources and strong institutional support in favour of only some. The provision of credit was made through the nationalisation of banks in the following years and supported by price policy, procurement,

levy and minimum support prices, and agricultural knowledge institutions. However, the cash resource-centric approach to technological change unintentionally incorporated non-inclusivity into the development strategy.

Interestingly, the policy steps taken during the early years after independence were also rather non-inclusive in their consequences. That does not mean, however, that these policies were 'exclusive' in their content, but by implication and incidence, these were structured to benefit a particular class of society. Instead, the heavy industry and investment-centred policy benefited and ushered in a strong white-coloured middle class. The new seed, water, fertiliser and extension technology was accessible to well-to-do farmers and resource-rich regions. Thus, the Green Revolution benefited farmers with reasonable control of resources and incidentally excluded many resource-poor farmers. As an obvious outcome, inequality increased, especially in rural India, and discontent increased.

2. Initial Challenges

A strong influence of the left ideological front also marked these years. A strong contingent of left-oriented policymakers emerged. Their left-leaning was reflected more in their observations of income inequality, especially in rural India. The poverty numbers were climbing up, with a more significant number of people getting impoverished. Initially, the after-effects of the Green Revolution brought forth interpersonal and interregional inequalities. Besides, as the poverty numbers were climbing, discontent in the countryside rose. It erupted in the form of an extremist left CPI(ML) movement, and many youngsters joined the movement to pursue a dream of change. It was around the same time that Robert McNamara, the influential president of the World Bank, in his opening address, talked about directly reaching people with low incomes through specially designed welfare schemes. The resounding mandate in the 1971 elections reflected the promise of poverty eradication. The discontent among the poor in the countryside directed the policymakers to pick the schemes that benefitted the poor. Inclusivity came on the policy cards in the form of Garibi Hatao and Antyodaya. However, the results were not exemplary due to the flawed designs of many schemes that dealt with poverty eradication. The new class of corrupt officials and politicians proliferated. At the end of this phase, the sprouting discontent started spreading all over the country, and agitations led by the late Shri Jayaprakash Narain (JP) swept the country to its length and breadth. In order to contain the agitations, a national emergency was declared, and as an aftermath, the group led by JP swept the poll. India faced a volatile political period, which was reflected in numerous institutional problems. Inequity, regional disparity and inclusivity disappeared behind a blurred shroud (Bhattacharya and Saktivel., 2004). The political instability was at the forefront, reflected in the wavering governance. This phase had its toll on inclusivity. We had set back the wheel. Naturally, the policies were not inclusive in their design and content but rather 'exclusive'. The slow decline in the poverty ratio and increased inequalities worried the government. At the same time, the macroeconomic levers were going out of control. Beginning with the 1985 budget, when the late Dr VP Singh, as Finance Minister, introduced the beginning of liberalisation, till 1990, the macroeconomic structure of the country was becoming decrepit. Policymakers noted this, and with the intervention of the IMF and World Bank, the structural adjustment programme was injected. Incidentally, in all these hurried policy-making exercises, the policy towards 'inclusivity' and attending to the last person at the bottom of the ladder was forgotten. Gandiji's Daridra Narain was the person kept in waiting.

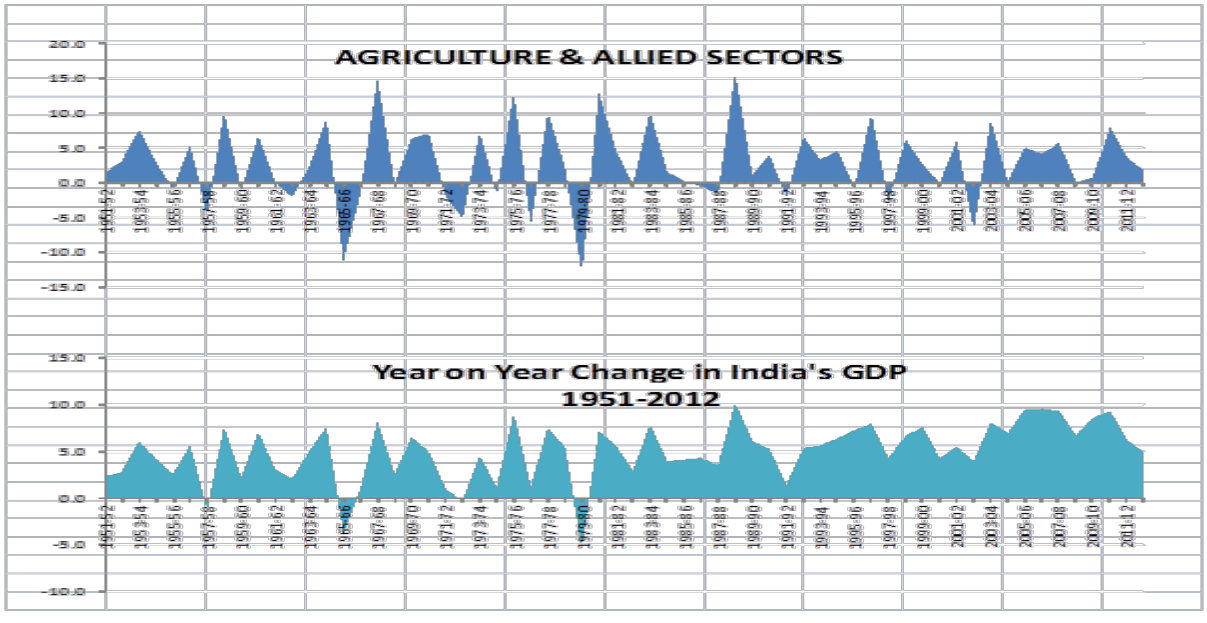
The new economic policies of liberalisation and globalisation had their usual opposition in the country. In the academic circle, it was felt that the new economic policy would enhance inequalities and increase poverty. It was also felt that the new economic policy would give the control of the economy in the hands of foreign

powers a xenophobic reaction to an almost normal correction process. Every step in the new economic policy confronted stiff opposition, even from the parties in league with the Government (Left parties in UPA-1). Therefore, it was not unexpected that development had to focus on inclusivity. The approach paper of the 11th five-year plan on this political background elaborately discussed inclusive development policy. The mute question, however, remained unanswered about the socio-economic platform of the country to allow inclusivity imposed by a policy that exclusively depended on a top-down approach. The 1993 amendment to the Indian constitution, which brought decentralisation in development, had a delayed start and somewhat tardy progress. The achievements during the 11th five-year plan that emphasised inclusivity are also arguable.

Agriculture is the mainstay of occupation in rural India and the only vocation in the country's most backward regions. It is also the sector that carries the country's largest share of low-income people. Indian agriculture has been undergoing phases of stagnation and recovery. Sporadic instances exist where this sector has shown significant growth, contributing to the national GDP growth. Usually, over the Economic Surveys, it was a routine comment to dump the blame for the lower growth rate of the economy on the agricultural sector. The comment was typical and repeated, saying that since the monsoons failed and the agriculture sector did not perform as expected, the aggregate growth of the economy has been depressed. It is true that if the agricultural sector fails, the aggregate growth is affected. However, the converse is also true that the economy's high growth also stands with the support of the agriculture sector. That underscores the decisive role of the agricultural sector despite its low share of contribution to the GDP.

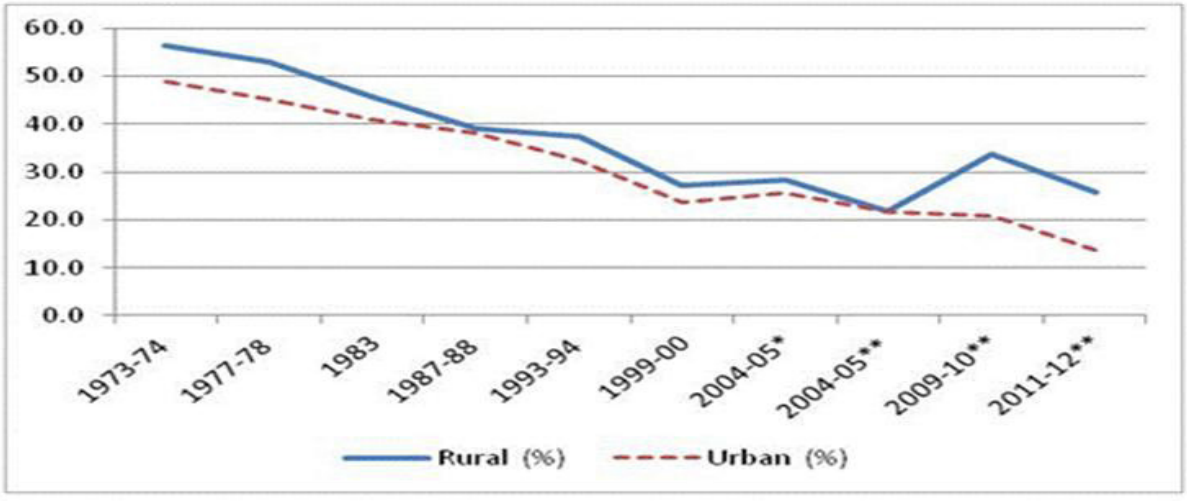
It is pretty easy to observe that when the agricultural sector has depressed growth rates, the aggregate GDP also drops. The comparison of GDP and agricultural growth is depicted in Figure 6, which reveals the concordance between the two. Whenever the growth in the agricultural sector was good, the aggregate growth of the economy was also satisfactory. At the same time, the troughs in the agricultural GDP carried the shock to the aggregate GDP growth. That indicates the vulnerability of the aggregate GDP concerning the agricultural sector. Above that, the agricultural sector also has a unique position in terms of inclusivity. In the following few paragraphs, we shall deliberate on how the agricultural sector's bypassed social and economic groups are located.

Figure 1: Relative performance of Agriculture in the Economy.



Source: Based on the data from Indiastat.com.

Figure 2: Declining Rural and Urban Poverty



Source: Author's creation.

It is unnecessary to state that agriculture is the mainstay of rural areas, and the entire country, including everyone, depends on agriculture, at least for food and certain raw materials. It has become very clear from Figure 1.1 above that if agriculture performs, the economy does, and it is the shock of the agriculture sector which is invariably carried out to the economy. That establishes the primacy of the sector, which needs to be restarted. However, the components of the society that engage themselves in agriculture belong mainly to the lower- and middle-income groups in rural areas. Castes are being cultivated across the regions in India, and the agricultural labourers come primarily from the bottom rung of the caste structure. Therefore, poverty is mainly located in the bottom rung of the society, which looks after agriculture, and that is a default position in the social development of this country. Therefore, inclusivity needs to address those components of the society that the policy has bypassed during the last seven decades. It is not erroneous to say that certain interventions in agriculture, like the Green Revolution (that needed more significant cash inputs, generally not available to the bottom rung of the cultivators), increased costs (Nadkarni 1988 and Reddy,1993)

Table 1. Share of Agri Workforce in Total Workforce and Share of GDP

Year	1971	1981	1991	2001	2011
Work Force	72.1	68.4	67.1	58.2	54.6
Share of GDP	40.5	35.3	28.5	22.4	14.4

Source: Based on data from Indiastat.com

Table 2: Poverty Ratios Rural and Urban India

	Poverty Ratio (%)			Share Of Poverty (Per cent to total)		
Year	**Rural**	**Urban**	**Total**	**Rural**	**Urban**	**Total**
Expert Group 2009 (Tendulkar Methodology)						
1. 1993-94	50.1	31.8	45.3	81.4	18.5	100.0
2. 2004-05	41.8	25.7	37.2	80.0	20.0	100.0
3. 2009-10	33.8	20.9	29.8	78.4	21.6	100.0
4. 2011-12	25.7	13.7	21.9	80.4	19.6	100.0

	Poverty Ratio (%)			Share Of Poverty (Per cent to total)		
Year	Rural	Urban	Total	Rural	Urban	Total
Expert Group 1993 (Lakdawala Methodology - Official)						
1. 1993-94	37.3	32.4	36	76.2	23.8	100.0
2. 2004-05	28.3	25.7	27.5	73.2	26.8	100.0

Source: Based on data from the Planning Commission.

3. Staggered Journey of Indian Agriculture

Indian agriculture is marked by cyclical phases of growth and stagnation after the independence (Sawant, 1983). It started with an intense colonial hangover, and the central problem was food scarcity, which needed to be tackled with policy instruments. There was a complete absence of a long-term agricultural development blueprint to substantially enhance agricultural production quickly. At the same time, in an infant nation, Indian policy wizards were engaged with homework to search for a suitable development model. Two international ideological pulls were quite strong on the policy. These two were quite dominant ideologies dictating economic policies. The choice was tricky and complicated, and Prime Minister Pandit Jawaharlal Nehru preferred a mixed economy, possibly taking the best out of the two models. Planning began in the economy, with the first plan unfolding an investment model in rural areas. Bhalla and Singh, 2001 fully view the developments during that period and in later years. The agricultural sector was moving at its natural pace with some policy tinkering in the form of Community Development and village-level schemes. The drought of 1965-66 and the subsequent year brought the agriculture sector to a grinding speed, and consequently, policy need was invoked. The foodgrain availability in the economy had touched the lowest minimum. The agriculture sector did not show the required promise to meet that massive obligation of food grains within the economy. Added to that, the war with Pakistan had crippled the macroeconomic strongholds. Domestic political stability was a given advantage. A decision to import a significant amount of new paddy and wheat seeds was made at the cabinet level. The decision was pushed forward by the then Minister for Agriculture, Dr C Subramanyan, and supported by the Prime Minister. Things started moving in agriculture significantly. Food grain production and productivity experienced a quantum jump during the years, and the Green Revolution ushered in India. The accommodation with the green revolution and political instability in the mid-seventies dominated the fourth phase in the travelogue of Indian agriculture. The political instability also inflicted significant negative externality on the sector's growth. Many externalities surfaced, and a deceleration in growth was experienced in the early 1980s (Deshpande et al., 2004). The environmental effects of the Green Revolution and the economic fallouts were quite significant.

The early eighties saw the emergence of a new focus on industries, and it was in 1982, a deliberate policy decision was taken to allow joint manufacturing in the country. Foreign direct investment in specific sectors was allowed, and we could see the transition from the old Bajaj, Vespa or Lambretta scooters. Many new two-wheelers and vehicles like Hiro-Honda and Kawasaki-Bajaj came into the market with collaborative manufacturing. The television and telecom revolution also began, but along with this, there was relative neglect of the agricultural sector. All this was due to the background of a politically unstable state, and no firm agricultural policy could be made (Aziz, Sartaj, 1990). The macroeconomic crisis of 1990-91 shook the country and changed the course of history. The economy, along with agriculture, moved towards market centralism. The new roads, new equations were being drawn and the decades of 90s and 2000 saw significant political changes along with policy. The first time India had an Agricultural Policy document was in 1999.

As usual, that remained on the shelves of the Ministry of Agriculture for the coming decades. These two decades also saw the emergence of international trade as a central policy initiative. By the mid-90s, the WTO agreement was signed, and India became a prominent member of the WTO. International trade became one of the central points in our discussions on agriculture, and QR was a pretty troublesome area to deal with (Deshpande & Thippaiah, 2005). Willy-nilly, the sector had to participate in international trade despite the fragile institutional backup. A few farmers (white-collared farmers) could graduate to this new environment and participate in international trade. Agricultural trade (imports plus exports) increased from ₹ 9284 crores (in the triennium ending 1992-93) to ₹ 46 331crores (TE 2002-03) and further to ₹ 2,62,299 crores (TE 2012-13) and ₹ 3,55,684 crores (TE 2015-16) respectively. India was poised to take on the world market, but this situation was confined to a few regions, a few crops and only some groups of farmers. As a result, there were farmers with significantly high incomes, and at the same time, many had to manage their livelihoods on really meagre income (Deshpande & Prabhu, 2005). Many authors have concluded that the actual net income of the farmers has not increased and largely remained stagnant during the last two decades. The climatic conditions, as well as inefficiency in the markets, also played havoc with the farmers. The distress in the farm sector was visible during the late nineties and aggravated further. The inequality increased significantly, and so did the distress across the country. The unrest among the farmers engulfed the entire country. The 11th plan envisaged a 4 per cent agriculture growth, which could not be achieved despite a vibrant scheme like RKVY. We centralise growth in every discussion on the agricultural sector, which has eluded us for many years. This paper documents the rapids through which Indian agriculture navigated the path during the last seven decades. We do not prefer to go chronologically and shall focus on only significant discussion points.

4. Changing Structure of Agricultural Economy

Growth in Indian agriculture has been analysed by many, including Bhalla & Singh 2001; Alagh, 2013; Deokar and Shetty, 2014. We have been talking about the growth performance of Indian agriculture in the recent past and ambitions for a double-digit rate of growth. Dandekar (1994) gives a good historical and authoritative account of the developments. There has been much discussion about the feasibility of such ambition in the literature. Subsequently, the NITI Ayog came out with a new game of doubling the farmers' income. The desire to achieve such a noble destination is most welcome, but one needs to look at the scaffolding to prepare for this purpose. Our experience of long-term growth will bother us in this new experiment as, historically, we have often failed to reach the set goals. Here, it is not the growth alone that would suffice to double the farmers' income, but on priority, imperfections in the markets have to be removed. Our contribution to GDP in the agriculture sector has been the lowest across sectors, and we hope to reach about 4% rate of growth in agriculture and 8.2% during the 12th Plan. This was the plan's target, which was aborted after the closure of the Planning Commission.

Table 3: Growth Performance of Sectors across the Periods (Based on 2004-05 prices)

{Average Annual Compound Growth Rates (%)}

Sl. No.	Growth Periods	Agriculture	Industry	Services	GDP
1	1950-51 to 1968-69	2.01	6.48	4.60	3.67
2	1968-69 to 1975-76	2.19	2.75	4.07	3.07
3	1975-76 to 1988-89	2.74	4.89	5.80	4.30
4	1988-89 to 1995-96	2.69	5.59	6.38	5.06

Sl. No.	Growth Periods	Agriculture	Industry	Services	GDP
5	1995-96 to 2004-05	2.23	5.57	7.87	5.92
6	2004-05 to 2016-17	3.19	6.41	8.89	7.29

Note: *Phase I: Pre-green revolution period (PGR) – 1960-61 to 1968-69; (ii) Phase II: Early green revolution period (EGR) – 1968-69 to 1975-76; (iii) Phase III: Period of wider technology dissemination (WTD) – 1975-76 to 1988-89; (iv) Phase IV: Period of diversification (DIV) – 1988-89 to 1995-96; (v) Phase V: Post-reform period (PR) – 1995-96 to 2004-05; (vi) Phase VI: Period of recovery (REC) – 2004-05 to 2016-17. Growth rates computed by the author.*

The ground situation, however, betrays these ambitions by far margins. The growth rates presented in Table 1.6 are based on the traditional methodology across the phases. These growth rates are based on the data from National Accounts Statistics and the GDP contributed by the sectors at constant prices. Chand and Parappurathu, 2012 used similar periods and found that the growth trajectory has shifted from less than one per cent to about 3 per cent. It is pretty clear that till 2004-05, we could not cross the 3% barrier of growth in the agricultural sector even though the aggregate economy progressed quite well. The overall GDP grew above 5% and reached almost 8%, but the contribution of agriculture to this overall growth has always remained a worry. Only from 2004-05 to 2016-17 could the agriculture sector marginally cross the 3% barrier and post a growth rate of about 3.19% per annum.

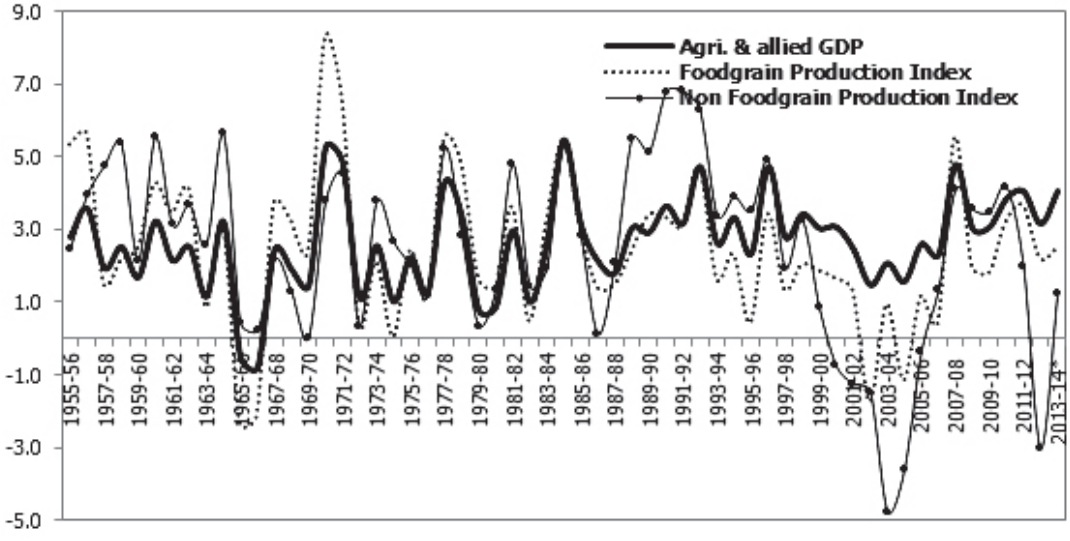
Usually, growth rates are calculated either in terms of year-to-year changes or based on the exponential trend estimated through a regression equation. After a lengthy discussion in the workshop organised at Lonawala by the Indian Society of Agricultural Economics in 1980, it was concluded that both methods are misleading (Dandekar, 1980). At the seminar, Prof Dandekar concluded about truly representative growth rates: "The research worker who explores the statistical method for quantitative economic analysis and hopes to obtain meaningful results should bear in mind the limitations of his data and keep his expectations modest lest he might give up the whole analytical effort in unwarranted scepticism." (Dandekar, 1980, P12). That exposes the significance and wrong use of growth analyses unadjusted to weather fluctuations. Some years back in Karnataka, a discussion took place about the growth performance of agriculture. The State Government had confronted a ticklish issue: ' When monsoon and all other parameters were normal, how come the State Economic Survey reported negative growth for the agricultural sector? The government of Karnataka constituted a Committee (GoK, 2009) under my Chairmanship to clarify the issue, and it was found that the growth rates reported in the State Economic Survey (or, for that matter, in all Government publications) were only the 'per cent change over last year'. In my report, I pointed out the inherent mistake in any growth analysis. That pertains to the assumption of 'exponential growth behaviour in agriculture', an unpardonable folly. The performance of the agricultural sector has built-in fluctuations with troughs and peaks alternating due to weather fluctuations. In the earlier attempt, in Rao, Nadkarni and Deshpande (1980), I tried to work out Growth Rates excluding fluctuations. It involved throwing out some data, which was not a welcome idea. Growth rates should bring out the intrinsic behaviour in the series by using all the data and not throwing out any observations. This brought forth the fallacy of using the traditional growth rates as a policy tool. Following this, I looked closely at the data and 'Year-to-year' changes. It became clear that we needed to define a new growth measurement in the agricultural sector. I named it "Rolling Growth Rate", computed on a moving five-year series. The justification for rolling over five years is that the 'Probability of Bad / Bumper year' arrival from a long time series is about 20 %, and that would mean once in five years, we have an extreme observation. Therefore, a rolling five-year growth rate provided the inherent movement of the

growth. We suggested a five-year rolling growth rate as a policy tool that irons out the fluctuations. Figure 1 presents five-year rolling growth rates based on rolling five-year periods. The figure shows many fluctuations but no specific trend. I computed the five-year rolling growth rates; the results matched the ground realities (see Figure 1).

It is pretty clear from Figure 1.3 that the rolling growth rates of the GDP originating from the agriculture sector is that foodgrains and non-food grains series in production have always been under the 3.15% barrier. Over a long time series, the agricultural sector showed a sticky behaviour with this threshold of 3.15%. Although a few peaks can be observed, an equal number of troughs are visible. In particular, the sector's performance was not immensely encouraging between 1996-97 and 2007-08. Among the major reasons for the constrained growth at 3.15% is the large share of rain-fed agriculture, technological fatigue, fluctuating weather conditions that set back the clock, etc. Over 50% of the gross cropped area is at the mercy of monsoon rains. Even the area under irrigation also fluctuates according to the moods of the monsoon. In a drought year, we cannot expect irrigation support to be dependable. Besides, even though the technology has been supportive, it is mainly confined to wheat, paddy, and other crops. We began with a per hectare yield of 541 Kg in foodgrains in the triennium ending 1952-53, and today, in the triennium ending 2015-16, the use of foodgrains has crossed 2000 kgs per hectare.

A large share of this increase in productivity can be assigned to the increments in yield of rice and wheat only; the rest of the foodgrains have experienced stagnation in yield per hectare or, at the most, a marginal increment. Irrigation has been a critical determinant of growth and one does not have to get into any in-depth computations to prove that irrigation is the critical deciding factor of growth in the last decade. The support of irrigation has been increasing and the increase was quite sharp during 1980-90 and after that the yield growth has slowed down. Most of the increment in yield came out of increased irrigated area, fertiliser use and new varieties (Evenson, Pray and Rosengrant, 1999). They commented that the "Estimated effect of irrigation on TFP is strongly positive, indicating that irrigation does influence productivity above and beyond its value as an input (page.51)". The share of NIA to NSA has increased by about 6 percent per decade and this growth seem to have enhanced during the last two decades.

Figure 3: Five Years Rolling Growth Rates of Agricultural and Allied Sector GDP and Production ofFoodgrain and Non-Foodgrains in India



Source: Author's computations

Table 4: Source wise- Irrigation in India (in Million ha and % Share in brackets))

Sources	1950-51	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2013-14
Canal	8.3	10.4	12.8	15.3	17.5	16.0	15.4	16.3
	(39.7)	(42.1)	(41.2)	(39.4)	(36.5)	(29.0)	(25.3)	(23.9)
Tanks	3.6	4.6	4.1	3.2	2.9	2.5	2.0	1.8
	(17.2)	(18.6)	(13.2)	(8.2)	(6.0)	(4.5)	(3.3)	(2.7)
Wells &	6.0	7.3	11.9	17.7	24.69	33.8	35.9	42.4
Tube Wells	(28.7)	(29.6)	(38.3)	(45.6)	(51.4)	(61.3)	(58.9)	(62.3)
Other	3.0	2.4	2.3	2.6	2.9	2.9	7.6	7.5
Sources	(14.4)	(9.7)	(7.4)	(6.7)	(6.0)	(5.3)	(12.5)	(11.1)
	20.9	24.7	31.1	38.8	48.0	55.1	60.9	68.1
GIA	22.6	27.9	38.2	49.8	63.2	76.6	85.8	93.1*

Note: *Figures in brackets are in percentage to the total net irrigated area. * - Estimated based on trend*

Source: Author's computations based on data from the Directorate of Economics and Statistics, Ministry of Agriculture, Website

Indeed, during this phase, the resource intensity has also increased and consumption of fertilisers has gone up from about 15 kg per hectare to above 138 kg per hectare (see annexure Table 1). Similar growth is seen in the distribution of certified quality seeds. In the triennium ending 1982-83, certified quality seeds were distributed in 44 lakh quintals. It has reached 295 lakh quintals in the triennium ending 2015-16 (see annexure Table 1.1). However, these resource use increments did not translate into productivity increments proportionately. The actual net income of the farmer has almost stagnated over the years (Sen & Bhatia, 2004; Deshpande & Prabhu, 2005; Narayanamoorthy, 2007, 2013). The expressions of distress are loud and clear, getting acute over time. It needs to be seen why the increment in productivity is minuscule as against the growth in resource use; unfortunately, from the broad data trends, this seems to have not taken place, and that has also not been translated into the net income generated for the farmers.

Table 5: Population, Cultivators and Agricultural Labours in India (In million)

Year	Growth in General Population			Growth in Agricultural Workers**			Total Workers
	Total Population	ACGR (%) Total Pop.	Rural Population	Cultivators	Agri. Labourers	Agricultural Workers	
1951	361.1	1.25	298.6	69.9	27.3	97.2	139.5
			(82.7) *	(50.1)	(19.1)	(69.7)	(100.0)
1961	439.2	1.96	360.3	99.6	31.5	188.7	188.7
			(82.0) *	(52.8)	(16.7)	(69.5)	(100.0)
1971	548.2	2.22	439	78.2	47.5	180.4	180.4
			(80.1) *	(43.3)	(26.3)	(69.7)	(100.0)

Year	Growth in General Population			Growth in Agricultural Workers**			Total Workers
	Total Population	ACGR (%) Total Pop.	Rural Population	Cultivators	Agri. Labourers	Agricultural Workers	
1981	683.3	2.20	523.9	92.5	55.5	244.6	244.6
			(76.7) *	(37.8)	(22.7)	60.5)	(100.0)
1991	846.4	2.14	642.6	110.7	74.6	185.3	314.1
			(74.3) *	(35.2)	(23.8)	(59.0)	(100.0)
2001	1028.7	1.95	742.6	127.3	106.8	234.1	402.2
			(72.2) *	(31.7)	(26.6)	(58.2)	(100.0)
2011	1210.8	1.50	833.7	118.8	144.3	263.1	481.7
			(68.9) *	(24.7)	(30.0)	(54.6)	(100.0)

Note: *Figures in parentheses represent percentages. * Percentage to total population. ** includes main and marginal Workers—computations by the author.*

Source: Agricultural Statistics at a Glance 2015, Ministry of Agriculture, Govt. of India.

Any structural change in an economy is a product of culture, society, income generation and the aggregate policy framework. The structural change in Indian agriculture began almost immediately after independence. It is well known that culturally, agriculture was considered inferior to urban-based work, and so was the farmer. This culturally imposed inferiority on the profession and the sector had a telling effect on the foregoing structural changes. Its reflection could be seen on the policy front, too, and for a long time, we did not have any policy blueprint for the sector's development. Not many farmers preferred to stay in agriculture or their children. The lure and attraction of urbane goods and services steadily eroded the emphasis on the policy towards agriculture.

It is not a big secret that many of the graduates from agricultural Universities do not practice agriculture after completing their education in agriculture. They prefer white-collared jobs in urban locations rather than soiling their hands in agriculture. As a result, the proportion of the workforce in agriculture was going down, which is usually justified in development economics as an indicator of development trends. However, the speed at which the sectors' contribution is shrinking against the workforce causes an alarm. The population structure depends on agriculture, and the cultivators and labourers working in the agriculture sector have undergone significant changes over the decades. These are usual observations, but something unusual is also happening in the sector that needs attention. It can be seen from Table 7 that the share of the rural population started declining from 1971 onwards, and the decline was quite sharp between 2001 and 2011, coinciding with the decade of liberalisation. Initially, the decline was about 2% to 4% (1951 to 1991), and suddenly it jumped to above 6 per cent in the last decade. This cannot be brushed aside as a usual trend, but there is clear evidence of de-realisation after 2001. This sharp decline from 2001 to 2011 is a matter of anxiety.

There can be two implications for the overall structural change in the Indian economy. First, the rural workers are finding better work environments elsewhere (non-rural locations), shifting out of agriculture (a Lewisian shift) in search of better income sources. Those new emerging vocations attract them. However, this cannot be compared strictly with the Lewesian transfer, as it is happening more out of the 'Push Effect' than the 'Pull Effect'. Agriculturists and a large portion of the rural population do not find staying in rural areas or

the agriculture sector economical. Hence, they prefer to move out of the sector. Second, the observation from Table 8 shows the secular decline in the percentage of cultivators to total agricultural workers. That is changing the composition of the rural workforce due to economic compulsions rather than the natural development process. The share of cultivators decreased from 53% in 1961 to 31% in 2001. Except in the first decade, till 2001, the waning in the share of cultivators was about 4% per decade, but suddenly, between 2001 and 2011, the decline was very sharp, about 7% of the total workforce. This is an alarming indicator of the de-peasantisation of the agrarian economy. At the same time, the share of agricultural labourers in the total agricultural workers has increased by about 3% per decade. In any case, it is a fact that agriculturists prefer to leave agriculture, leaving agricultural labour behind. The process of de-paganization is set in rural areas.

In Western theories of development economics, it is well accepted that development is where the economy transitions from agriculture to non-agriculture (Ray, Debraj, 1998). Therefore, this transition could be seen in the percentage of GDP generated from agriculture and the workforce in the agriculture sector. In Table 1.9, we have presented these changes in the economy's structure as reflected in the share of GDP and the workforce across sectors. The contribution of agriculture to GDP has been going down during the last seven decades, as has the share of the workforce. It is observed that this happened sharply during 2000-11. Further, the decline is also seen in the share of the workforce. It indicates a large share of the rural population moving as migrants to urban areas. It can be inferred that Liberalisation has drawn out the workforce from agriculture and rural India, but it has failed to increase the GDP generated in the sector proportionately. This is the residual of earlier policies, and therefore, one can expect a larger percolation of growth in the rural areas if liberalisation is to be a successful policy.

Table 6: Changes in Structural Distribution of Economy and Employment

Sl No	Year	Percentage Share in GDP				Percentage Share in Total Workers		
		Agriculture & Allied	Agriculture	Industry	Services	Agriculture & Allied	Industry	Services
1	1950-51	51.9	41.8	16.2	29.5	72.1	10.7	17.2
2	1960-61	47.6	39.4	20.1	30.2	71.8	12.2	16.0
3	1970-71	41.7	34.2	23.6	33.3	72.1	11.2	16.7
4	1980-81	35.3	29.6	26.2	37.5	68.5	13.5	17.7
5	1990-91	29.5	24.9	27.6	42.5	66.9	11.9	19.2
6	2000-01	22.3	18.8	27.3	50.4	56.9	16.9	25.8
7	2010-11	14.6	12.4	27.9	57.5	54.6	45.4	
8	2016-17	11.6	9.9	25.8	62.7	-	-	-

Source: Computations by the author based on data from economic surveys for the respective years.

The growth performance of various subsectors and allied agricultural sectors indicates a substantial structural change witnessed in the agricultural sector under new economic policies. However, we saw no substantial changes in the crop sector until the 1990s. However, GDP originating from agriculture and allied sectors at constant prices has increased substantially after 2004-05 in Terms of Trade (Shaha, 2015). The allied sectors contributed significantly, including animal husbandry and livestock economy. Net agricultural output at constant prices from 1980 onwards increased by more than 3% per annum, and the growth was quite substantial during the last two decades. One of the important observations here is that agriculture is no longer restricted only to the crop economy sector but has mainly been contributed to by horticulture, animal

husbandry, and other allied activities. That clearly shows the move towards integrated farming, which used to be discussed in policy two decades ago. This can be seen in Table 10. We need to revive the impetus to step up the growth of agriculture and the farmers' incomes.

Table 7: Growth Performance of Production and Agricultural Output and Input in India across Different Decades and Phases

Periods	Production		Agriculture & Allied Sector GDP# (2004-05 Constant prices)	Output and Input (2004-05 Constant Prices)			
	Foodgrains	Non-Foodgrains		Crop Output	Livestock output	Agri* Inputs	Net Agri Output**
Decades							
1950s	4.25	3.66	2.71	3.06	1.42	2.00	2.91
1960s	1.85	1.49	1.51	1.70	0.41	2.34	1.25
1970s	2.07	2.17	1.74	1.79	3.92	3.27	1.88
1980s	2.73	3.77	2.97	2.24	4.91	1.96	3.11
1990s	2.09	2.67	3.34	3.02	3.79	2.58	3.40
2000-01 to 2013-14	2.52	1.18	3.41	3.17	4.52	3.46	3.57
Phases							
1950-51 to 1965-66	2.96	3.60	2.27	2.47	1.22	1.90	2.31
1966-67 to 1990-91	2.84	2.96	2.62	2.75	4.16	3.90	2.80
1991-92 to 2013-14	1.70	0.55	3.02	2.67	4.00	2.84	3.09

*Note – # GDP at factor cost; * Crop and Livestock; ** output minus inputs*

Source – Author's computations based on Various issues of National Account Statistics, MOSPI, GoI and Agricultural Statistics at a Glance, Ministry of Agriculture, GoI

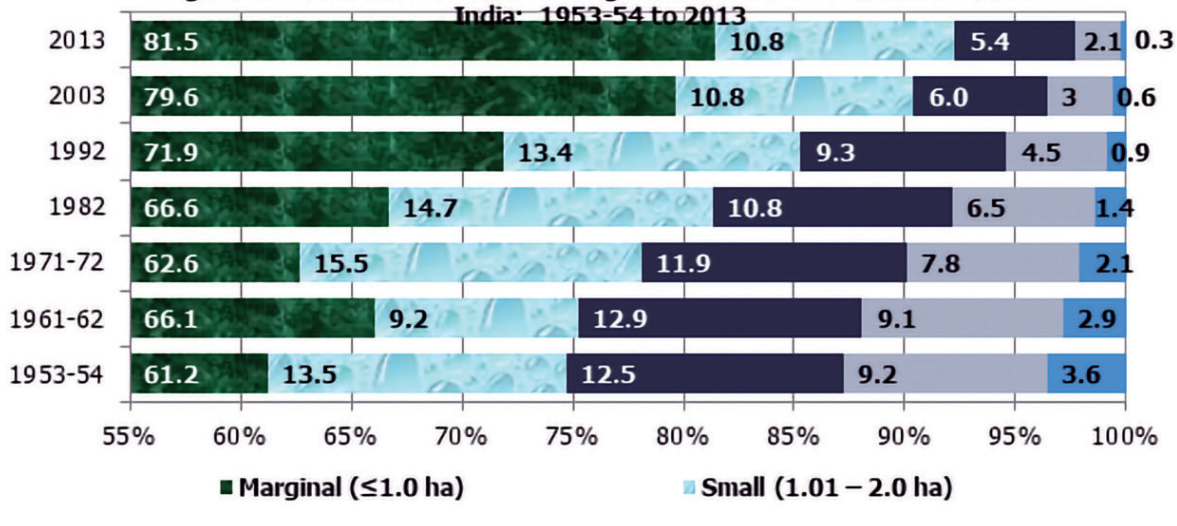
Another important structural change in agriculture is the marginalisation of the farmers. The process of marginalisation can be understood from two different angles. First, as usually understood by agricultural economists, the demographic pressure and non-viability of the land result in the fragmentation of holdings. As a result, we have an intense proliferation of small and marginal holdings across the country (see Table 1.10). A substantial increase in the marginal holdings makes it difficult for the cultivators to adopt new technology or inputs. That brings down productivity at the aggregate level due to the high density of marginal and small farmers. Despite their best efforts, they cannot bring productivity to the levels promised by the technology due to the cash-intensive technology. On aggregate, more than 80% of the farmers have less than one-hectare holdings, and about 11% have holdings between one and 2 ha. This would mean many farmers cannot even think of reaching the doorstep of the expensive technologies, let alone adopting these to the fullest extent. Small farm-based cultivation further marginalises the farmers economically by providing them only frugal income and increasing their dependence on state agencies, private money lenders, and land sharks. This process of marginalisation has increased very sharply between 1992 and 2003. Between these two years, we could see that the increment in the share of marginal holdings is about 8%, unprecedentedly high compared to the earlier increments.

Table 8: Distribution of Household Owning Land and Area Owned by Size of Holdings in Rural Areas of India

	Size of Holdings	1953-54	1961-62	1971-72	1982	1992	2003	2013
I	**Landless Households (%)**	**23.09**	**11.69**	**9.60**	**11.30**	**11.30**	**10.00**	**7.41**
II	**Percentage of All Rural Households**							
1	Marginal (≤1.0 ha)	61.24	66.06	62.62	66.64	71.88	79.60	81.45
2	Small (1.01 – 2.0 ha)	13.49	9.16	15.49	14.70	13.42	10.80	10.80
	Sub-Total	74.73	75.22	78.11	81.34	85.30	90.40	92.25
3	Semi- Medium (2.01 – 4.0 ha)	12.50	12.86	11.94	10.78	9.28	6.00	5.41
4	Medium (4.01- 10.0 ha)	9.17	9.07	7.83	6.45	4.54	3.00	2.08
5	Large (10.01 ha & above)	3.60	2.85	2.12	1.42	0.88	0.60	0.26
III	**Percentage to Total Area Owned**							
1	Marginal (≤1.0 ha)	6.23	7.59	9.76	12.22	16.93	23.02	29.76
2	Small (1.01 – 2.0 ha)	10.09	12.40	14.68	16.49	18.59	20.38	23.53
	Sub-Total	**16.32**	**19.99**	**24.44**	**28.71**	**35.52**	**43.40**	**53.29**
3	Semi- Medium (2.01 – 4.0 ha)	18.40	20.54	21.92	23.38	24.58	21.97	22.07
4	Medium (4.01- 10.0 ha)	29.11	31.23	30.73	29.83	26.07	23.08	18.83
5	Large (10.01 ha & above)	36.17	28.24	22.91	18.08	13.83	11.55	5.81

Source – 1) Government of India (1968), Tables with Notes on Some Aspects of Landholdings in Rural Areas (States and All India Estimates), Report No. 144, New Delhi: NSSO, 2) Government of India (2006 & 2016), Household Ownership Holdings in India, 2003 & 2013, Report No. 491 & 571, NSS 59th Round & 71st Round respectively, New Delhi: NSSO. This table is based on National Sample Survey Data and, hence, not directly comparable with the Agricultural Census Data presented earlier. The trends, however, are precisely similar.

Figure 4: Distribution of Land Holdings across Rural HHs Land Owners in India: 1953-54 to 2013



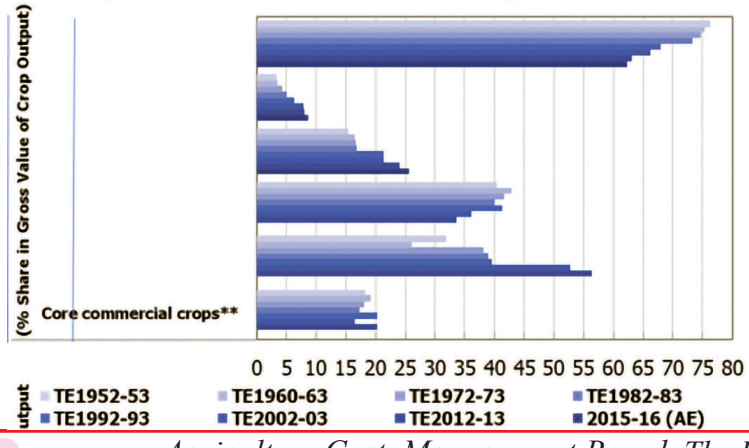
Source: The author's creation is based on data from the source, as shown in Table 1.10.

There are a few important pickups from the foregoing analysis that we should not miss when reading about the changing agrarian structure of India. First, the share of GDP originating from agriculture and allied sectors has been declining, which is quite sharp during the phase of liberalisation. This can happen due to the sharp increase in GDP growth from the non-agriculture sector or the deceleration of growth in the agriculture and allied sectors. On the safer side, we can assume that this decline in the share is mainly attributable to high incremental growth in the non-agricultural sector. However, when we look at the relative shares of GVO from agriculture, it is problematic that the share of the crop sector has been almost stagnant in real terms for the past two decades. Second, it was observed that the share of the rural population and cultivators in the total workforce is declining. It is well-known that farmers do not prefer farming as their primary vocation due to the lower dignity assigned to the profession by society and the low-income generation and dependence on state or financial institutions (formal or informal), even for bare survival. The Population Census data from 1991 and 2011 indicates that about 50 lakh cultivators have changed their profession from cultivation. As a result, the number of cultivators indicated in the Population Census has declined by 50 lakhs, and the operational land has decreased by more than 31 lakh hectares. This would mean they have changed their profession to agricultural labour, migrated to urban areas for work in any available vocations in cities or abandoned cultivation of 31 lakh hectares. At the same time, we also observed that the share of agricultural labour has increased substantially during that period. Third, the marginalisation of the farmers, both in terms of the size of landholding and on the economic front, could be observed in rural India, and that is manifested in the agitations we see in most of the states. This marginalisation and loss of professional dignity has sparked agitations among farmers. This change has intensified quite significantly during the last three decades.

4. Liberalisation and Crop Commercialisation

During the last six decades, Indian agriculture has changed from subsistence to a partially commercial agricultural sector. The Agricultural Produce Market Committee Act was passed in the late 60s, and the market forces became more substantial in the sector. As a result, commercialisation got faster, and even though we had achieved food self-sufficiency at the end of the seventies, as a routine change, the cultivators preferred commercial crops, moving away from food crops. Commercialisation in the crop economy started slowly increasing in the agricultural sector. Cash component or share of paid-out cost increased in the total cost of production. At the same time, the cash requirement for incremental lifestyles to copy urban consumption patterns also increased. Punjab farmers became the first-rank rice traders because of this change in the market structure and commercialisation. Liberalisation during the 1990s played a critical role in increasing the velocity of this process. The agricultural sector became trade-friendly as exports of agricultural commodities increased significantly.

Figure 5: Pace of Commercialisation in Indian Agriculture



*Note –1) * Condiments & Spices, Fruits & Veg, Plantation crops; ** Total Oilseeds, Sugarcane, Total Fibre and Tobacco; ***condiments & Spices, Fruits & Veg, Plantation and floriculture & other horticulture crops; 2) light to dark sheds indicate periodic progression beginning from TE 1952-53 to 2015-16; 3) Value of crop output 2004-05 series*

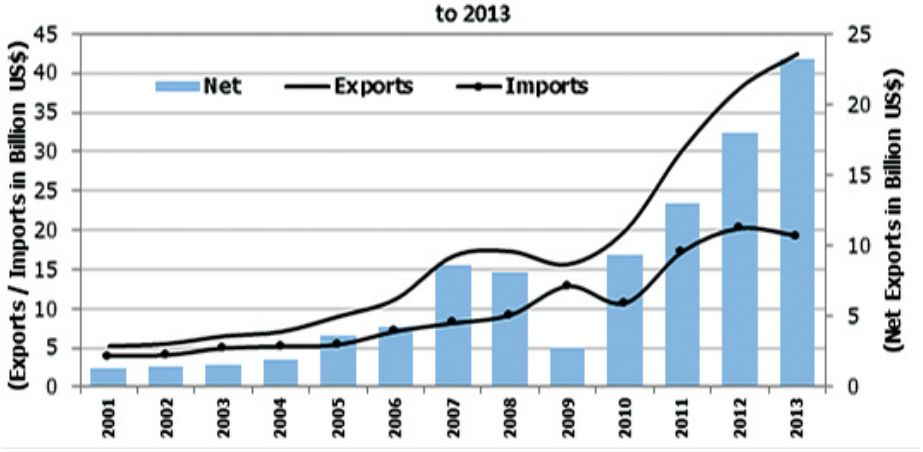
Source: Authors' depiction based on data from Land Use Statistics, DE&S,

Government of India, Ministry of Agriculture Website and National Account Statistics 2004-05 Back Series and 2013 and 2013, CSO, New Delhi: MOSPI

All these indicators depict six different faces of commercialisation and increase in the process or time. It is clear from Figure 1.9 that commercialisation increased at a slower pace from 1992 to 1993, but the pace increased sharply after that. This, however, should not be construed as higher income increments in the agricultural sector. The commercialisation process possibly has injected some new inequality in the agricultural sector. The possibility to graduate to commercial agriculture was primarily available to the resource-wealthy farmers with good access to state-initiated schemes and water resources. Therefore, those farmers who did not have access to these facilities remained in the lower income bracket, and the lucky ones graduated from the higher income bracket. This new source of inequality was injected into the agriculture sector during liberalisation.

In 1991 and after the advent of WTO, commercialisation increased. From 1990-91 to 2000-01, international trade increased slowly, and the agricultural sector did not achieve high export targets. The trade balance was favourable, and the pace of exports increased after 2010-11. This has brought in new avenues of sources of income for the Indian agriculturists

Figure 6: Performance of agricultural trade in different phases: 2001 to 2013



Source: The author's creation is based on data from economic surveys from various years.

The policy of liberalisation and globalisation opened the economy for international trade. India paced faster towards active participation in WTO. That induced the pace of Indian agriculture, and the sector entered positively into global trade. However, whether international trade can become an engine of growth and an instrument to enhance farmers' income to the expected level is a question that remains unanswered. Given the structural composition of the agriculture sector, we have an intense proliferation of marginal and small farmers. The marketable and exportable surplus is not mainly generated from this group. More than that, as the density of holdings, the marginal and small farmers are predominant. The income of this group is the real crux of the story, which is to increase revenue in the agricultural sector. Therefore, we cannot expect the income of the marginal and small farmers to jump quantum with the help of international trade. However, this group should participate in the commercialisation of the agriculture sector very aggressively. That will surely change the prospects. If the group farming approach advocated by Beena Agarwal (2008, 2011) is followed, small and marginal farmers may have a chance to achieve better income levels.

The pledge of inclusivity was unequivocally extended to all the citizens of India, and the promise that they shall be part of the future development process was enshrined in the Constitution of India (Art 13, 14, 15 and 16 in no uncertain words. After achieving independence, this promise was forgotten, mainly due to the formidable

challenges India faced as an institutional country and the agglomeration of various hierarchical social and economic institutions. Due to the political pulls and pushes, the initial efforts in searching for an appropriate economic development model ended up choosing a middle path that heralded the country's 'mixed economy' model. The policymakers were stretched between Gandhian 'inclusive village development' (Gram Swaraj) at the one end and against inducing development with macro-economic initiatives on the other. Initially, the formulation of the first five-year plan was undertaken in a great hurry, and therefore, it could not delineate any long-term development strategy for the country. Only the second five-year plan deliberated minutely on the development model and accepted the modified Harrod-Domar model with a higher emphasis on investment in heavy industries. During those years, it was a worldwide phenomenon that promised development through industries, possibly a well-thought-out strategy. The economic development model of India was derived from the experience of the Soviet economic model on one side and the British industrial developmental expertise on the other. It would be erroneous if anyone writes that the planners emphasised the wrong path; similarly, no one can deny that the incorporation of the lowest strata of the economic classes in the development process was, albeit, inadvertently sidelined. After the experience of ten successive Five-year Plans, we returned to an inclusive growth path as a theme in the 11th Five Year Plan. The Approach paper stated that it should provide an opportunity to restructure policies to achieve "A new vision based on faster, more broad-based and inclusive growth. It is designed to reduce poverty and focus on bridging the various divides that continue to fragment our society." (GoI,2006, p 2,). It is time to trace the footsteps taken on this track.

Table 9: Marginalisation of Cultivators: Number of Operational Holdings

(Percent to total)

	1970-71	1980-81	1990-91	2000-01	2010-11
Marginal	51.0	56.4	59.4	62.9	67.0
Small	18.9	18.1	18.8	18.9	17.9
Semi-Medium	15.0	14.0	13.1	11.7	10.0
Medium	11.2	9.1	7.1	5.5	4.3
Large	3.9	2.4	1.6	1.0	0.7
All Holdings	100	100	100	100	100

Source: Agricultural Census for the respective years, Ministry of Agriculture and Farmer Welfare, New Delhi.

Inclusivity in the agricultural sector essentially requires fair land distribution. India inherited a very refractory agrarian structure with many intermediaries and landowners dominating the industry. The tenancy was usurious, and the tenants were highly exploited. The first step towards land reforms was taken in West Bengal, and it was only after 1967 that the land reforms were seriously pursued (Singh, Tarlok, Haque, and Reddy1992). I have dealt with the issues of land reforms in the Indian context in an FAO publication (See Deshpande, 2003). The entire policy of land reforms focused on the abolition of intermediaries and the abolition of Zamindari, as well as the tenancy reforms, ceiling on the land holding, and consultation of holdings. Among these, the consolation of holding had little success, but most states effectively implemented the first three components. However, the individual state laws had enough loopholes to bypass the implementation processes (See Deshpande, 2003). Prof Dandekar had warned in 1967 that the land reforms would not be successful, especially in the components of tenancy and ceiling on land Holdings. Today, when we look back at the success of land reforms, it is unfortunate that small and marginal farmers predominate the Indian land distribution structure. Over the years, this concentration of small and marginal farmers has increased (See

Table 1.2). Almost 85% of the land holdings belonged to small and marginal farmers, thereby marginalising the agricultural sector, and the result was unviable holdings predominating in the rural areas. The result was expected, and all those cultivators who found agriculture an unviable vocation preferred to leave agriculture and shift to urban areas. The small size of holdings and the agricultural markets being unfavourable to the small and marginal farmers, coupled with unreliability and increasing agriculture costs, caused many cultivators to leave the agricultural sector. This can be seen from Table 1.2. The Situation Assessment Survey conducted by NSSO revealed that almost 40% of the cultivators would like to quit cultivation due to low net income and increasing cost of living.

Table 10: Cultivators Leaving Agriculture and Swelling Agri Laborers

(In Lakhs)

Category	1991	2011	Change
Total Workers	3141.3	4817.4	1676.1 (53.35)
Cultivators	1246.8	1186.9	-59.9 -(4.80)
Agri Labourers	859.9	1443.3	+583.4 +(6.78)

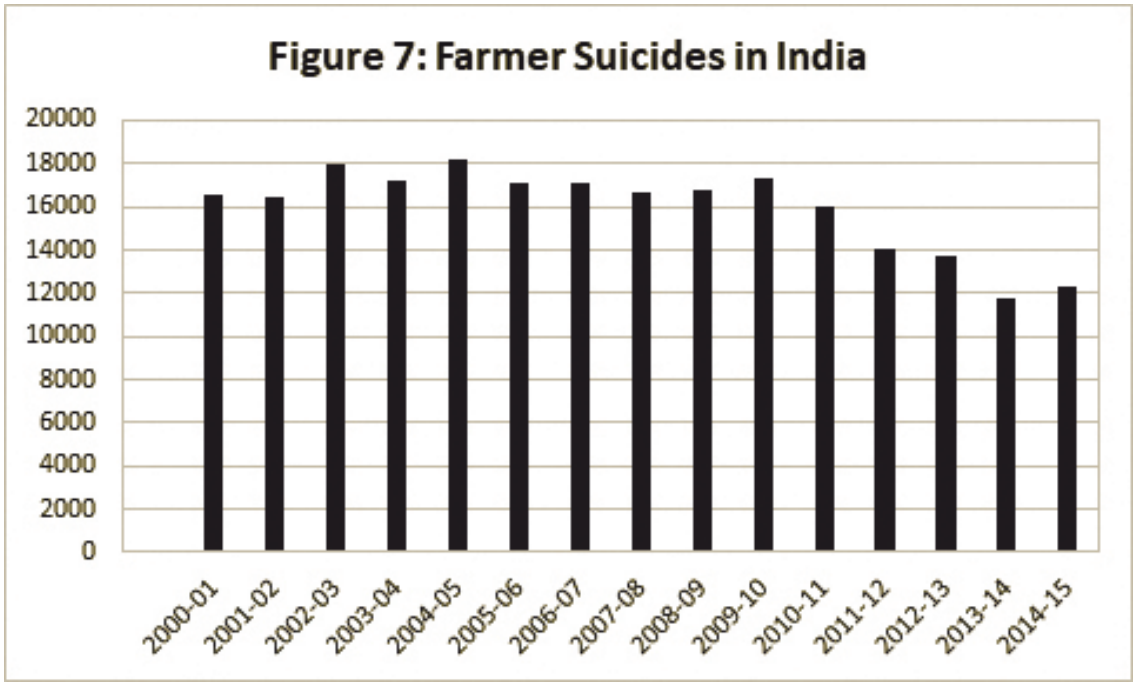
Source: Based on Census data. (Deshpande, 2014). Figures in brackets are % changes.

From the analysis of trends in poverty I carried out in 2014 investigating whether agriculture was the unavoidable destination for people experiencing poverty, conclusions emerged. First, the rural poverty ratio has stayed about the urban poverty ratio for all the years since the 60s. This has caused a significant shift of labourers from rural to urban areas. Our investigation into the trends in real agricultural income supported this. It was observed to have been almost stagnant during the last two decades (Deshpande & Prabhu, 2005). The second of the Russian noted in the study was that urban and rural poverty ratios have been declining. Still, the decline is smooth in urban areas, whereas there were quite a few fluctuations in the rural areas. The recent policy of MGNREGS did make a dent in rural poverty, but it is somewhat unequal to the usual scene in the morning when we find a row of birds sitting on the electric wire outside the house. MGNREGS precisely serves to keep the birds (poor) on the poverty line artificially, and this has continued for years as there has been hardly any decline in the number of persons attending MGNREGS right from the beginning of the program. That indicates that the programme does not necessarily alleviate the portal non-poor but instead ensures that the poor person stays poor and works under MGNREGS (Bhalla, 2000).

5. Whither the Farmer Distress

The increasing number of farmers' suicides due to severe agrarian distress became an important concern. About 20 farmers committed suicide almost every day in the country. A few authors traced the emergence of this agony to the technological change of 1967 that increased the demand for cash inputs for fertilisers, seeds, pesticides and irrigation. The culture of agriculture was changing very fast from a self-sufficient vocation to a cash-based activity, increasing market dependence. Growth in net farm income could not keep pace with the growth in cash inputs or input prices. The situation was aggravated during the last three decades due to policy fatigue (Narayanamoorthy, 2007) and successive droughts. The prices did not pick up even in the event of low production, and the net income of the farmers was shrinking. The recent agitations of farmers

in various parts of the country endorsed the agony even though the base of these had their political issues. The farm sector agony was high in Karnataka, Andhra Pradesh and Maharashtra. These became the hotspot of suicides. The deluge of farmers' suicides in these hotspots of suicides was mainly due to the shrinking net income flow in the farm sector and the failure of policies in locating the ailing spot. Many explanations were groped about by analysts, including the advent of WTO, GM varieties, Money lenders, Indebtedness, Price collapses, and spurious inputs. Agricultural production consistently demonstrates significant fluctuations, which are reflected in the net farm income flow. Falling income and increasing expenditure on the farm and in the house made the farmer borrow from any available source.



Source: Data from Manjunath A V and K B Ramappa (2017).

Declining net income constrained the payment to the lenders. As a result, the farmer households had to face increased suffering. Over years of repeated experience, the indebtedness entered a cascading effect, and it became impossible for the farmer to pay after a few years. By then, the farmer would have exhausted all the avenues of borrowing from institutional and non-institutional sources. As a result, farmers are compelled to press for loan waivers. The precarious situation of the farmers in Andhra Pradesh, Karnataka, Maharashtra, Rajasthan, Orissa, and Assam marked a watershed in agrarian distress. Even though the indebtedness cannot be taken as the only cause of farmers' decision to commit suicide, it is the culmination of the collapse of the farm household economy due to three market failures, namely factor markets, product market, technology market, and the state-supported input (Electricity, fertilisers and other) markets.

A recent study conducted at The Institute for Social and Economic Change in Bangalore, across all the states in the country, revealed quite a few interesting results (Manjunath and Ramappa. 2017). The suicides are primarily concentrated in five states, namely Maharashtra, Karnataka, Madhya Pradesh, Telangana, and Chattisgarh. This study concludes that the farmers essentially commit suicide under various stresses, among which financial stress is one of the significant reasons for audit by the family members of the farmers. The large density of suicides is high among the small and medium-sized holdings and is specially located among the farmers cultivating one or the other commercial crop. The rate of suicides has come down from 2012 to 2013, but that does not mean that the distress has multiplied in the farm sector.

Among many issues analysed in the study referred to above, it was found that suicides due to multiple reasons and indebtedness are the most prominent among them. Recently, we have seen a spate of loan waivers across states, which is considered one of the essential alleviatory measures. It is also argued that due to the frequent loan waivers, the credit discipline in the rural credit structure gets disturbed, and large NPAs accumulate with the expectation of the following loan waiver. However, it will be essential to build a proper safety net program and insurance coverage for the farmers and their loans. That has not been a significant policy thinking. One of the earlier studies (Deshpande & Arora, 2010) suggested many measures to alleviate the possible distress in the agricultural sector. Similarly, another book by Reddy and Mishra (2009) suggested several policy interventions. However, the government decided to utilise only short-term solutions rather than developing long-term policy alternatives (Stiglitz, 1987). Farmers' suffering in Indian agriculture due to cash deficiency and indebtedness is not a new phenomenon, and it was also noted in 1875 as the Deccan Riots. The emergence of such phenomenon after independence is in the planning and implementing policies in the agricultural sector without proper vision. The after-effects of the green revolution weakened the farmers' livelihood due to shrinking net income. Farms and farmers were getting marginalised and unviable over the years as cultivation became a drift on the farmer's household economy, especially that of the small and marginal farmers. In addition to this, market imperfections lead to an increase in farmers' net income. This is possible only through significant reforms in the APMC and the subsidy sector, which allow the free-market forces to operate.

6. Price the Achilles Heel

Farmers' price agitations have erupted significantly during the last four decades. The tools and methodology of the agricultural price policy came under severe scrutiny and have been commented on by many. Evolving long-term price policy was one of the significant recommendations of the HA committee (Government of India 1965.a) during the id-60s. Raj Krishna was one of the essential crusaders who put the right price policy in place. Hence, the Jha committee recommended interventions in the product markets in addition to the establishment of the Agricultural Prices Commission (APC). Prof M L Dantwala was appointed as APC's First Chairman, and the first report suggested the Minimum Support Prices for Paddy. In the process of the same report, we dealt with India's emergent price policy. It is stated in the preamble of the report that "The Agricultural Prices Commission was set up in January 1965 to advise Government on price policy for agricultural commodities, to evolve a balanced and integrated price structure in the perspective of the overall needs of the economy and with due regard to the interests of the producer and the consumer" (Govt. of India, APC Report, 1965, b). The emphasis of the price policy was to protect the interests of the producers and consumers, as well as to look into the overall needs of the economy. The terms of reference of the Agricultural Prices Commission were quite clear from the beginning and possibly blurred during the implementation process. It states:

"(i) To provide incentive to the producer for adopting technology and for maximising production; (ii) to ensure rational utilisation of land and other production resources; (iii) to keep in view the likely effect of the price policy on the rest of the economy, particularly on the cost of living, level of wages, industrial cost structure, etc.; (iv) to recommend from time to time, in respect of different commodities, measures necessary to make the price policy effective; (v) to examine, where necessary, the prevailing methods and cost of marketing of agricultural commodities in different regions, suggest measures to reduce costs of marketing and recommend fair price margins for different stages of marketing; (vi) to keep under review the developing price situation and to make appropriate recommendations, as and when necessary, within the framework of

the overall price policy; (vii) to keep under review studies relating to the price policy and arrangements for collection of information regarding agricultural prices and other related data and suggest improvements in the same; (vii) to advise on any problems relating to agricultural prices and production that may be referred to it by Government from time to time" (Govt. of India, January 1965,b, pp. 47-48).

One does not need great research to find that the Agriculture Prices Commission and its new incarnation in the form of the Commission on Agricultural Costs and Prices did not keep pace with the set objectives. Surprisingly, India has only one Agricultural Price Policy document published in 1986 (Government of India, 1986), and never people out of the Ministry of Agriculture or CACP shelves. In fact, throughout the years, CACP has been engaged only in competitions and declarations of MSP. The irony of the situation is that the MSP declared by CACP and, finally, the support prices announced by the Government of India or the State Governments are not the same. Therefore, the so-called scientific exercise of arriving at the cost of cultivation through cost accounting data across the country and declaring the prices based on various factors makes no sense. The committee headed by Dr S R Sen 1979 submitted its report in 1980 (Government of India 1980), suggesting many improvements in the entire methodology of declaring the support prices. The methodology underwent quite a few changes over time. The committee headed by Prof Abhijit Sen on 'Long-Term Grain Policy' (GoI, 2002) recommended that the scheme of Minimum Support Prices be continued with some corrections and these include: "(i) the CACP should be made an empowered statutory body; (ii) CACP should act directly based on C2 cost of production; (iii) CACP should also indicate a system of imputing family labour cost; (iv) CACP should recommend only one price for Paddy for the country as a whole; (v) All the procurement agencies and Public Grain Management Institutions should be legally bound by the MSP Policy; (vi) Central government should under-write open purchase of grains under MSP; (vii) FCI should be the buyer of last resort. FCI should withdraw from states like Punjab and Haryana and concentrate on other states" (Mentioned in the detailed recommendations given by the Committee, GoI, 2002, pp 9-10). The initial role of MSP was not only to protect the farmers but also to incentivise them to adopt new technology. In this context, Prof Dantwala was one of the founding architects of India's price policy. He stated, "Though no rigid formula has been accepted to determine the levels of floor prices, the criterion followed is that progressive farmers should find these levels adequate to encourage enterprise and investment to augment production through the adoption of improved technology with all its risk and uncertainty (emphasis added)" (Dantwala, 1996, Pp 213 originally published in 1967). The State intervention in the agricultural produce market started with the Minimum Support Prices and purchasing at the predecided prices when the market prices collapsed below that. Eyebrows were raised about its compatibility with WTO requirements as a subsidy, but continued with the objectives set in the first APC report. After a quarter of a century of implementing the market intervention scheme, Prof Dantwala wrote again during the early nineties, recognising the changing role of MSP and the interventions. It would be better to quote Professor Dantawala in this context; he wrote, "Likewise, intervention has to be selective. Its need must be established and its effectiveness should be constantly reviewed (emphasis added). The real problem is not simply establishing the legitimacy of intervention, but ensuring its effective and judicious implementation" (Dantwala, 1996, pp292, originally published in 1993). It is, therefore, imperative to revisit the entire agricultural price policy in the context of three important parameters. First, we are strongly entering into the international trade arena. Therefore, our farm sector must become competitive, and farm products should derive better comparative advantages than those of other competing countries. Second, many studies have shown that market imperfections mar the economic interests of farmers. We have been thinking of revising the APMC Act for almost two decades without any success. Market imperfections at the village markets and in the APMCs play havoc on the farmers. Therefore, the price policy statement should be more protective for the farmers as producers. The implementation of

MSP in the country is a well-known failure. Plugging the loopholes that cause such failure is not a difficult task; hence, it becomes the third and most important priority on the policy front. It is well-known that the actual root causes of farmers' agitations have been failure in the markets and the state not taking note of the welfare loss to the farmers due to such failures. It is high time that the government of India works on a long-term price policy, keeping in view the commitment to international trade, plugging the market inadequacies, incentivising the farmers and putting in place institutions that will ensure the farmer's welfare in the market (See Deshpande, 2008 and 2013).

6. Looking Ahead

Indian agriculture has undergone many changes during the last century. Initially, the hangover of colonial policies was predominantly drawn from the British development model and superimposed in India, when Gandhian village inclusivity was the dominant development philosophy. We did not significantly change the organisation of our administration and followed the British system. Keeping away the capitalistic or Socialist development alternatives, India took the path of a mixed economy with the Planning Commission at the helm, taking control as a policy think tank. The initial two decades after 1947 were invested in correcting the aberrations caused by the mismanagement of the food sector in the pre-independence years. The food availability was far below even the medically determined minimum needs. Distribution of food was a problem, and shortages of commodities dominated the markets. We confronted seven major constrictions in the agricultural sector, among many others. First, food production was quite insufficient due to the pressure of the population. The productivity of most of the crops was dismally low, and the crop pattern was subsistence-oriented, dominated by low-value, low-density crops. Second, irrigation and water resources were not well developed, except in a few pockets; India was largely monsoon-dependent. Third, the land distribution was extremely skewed, and land relations were refractory (Thorner & Thorner, 1958). Land reforms were strongly recommended by the sub-committee of the Congress Working Committee (1949), which was headed by Dr J C Kumarappa. Fourth, the institutional support to agriculture was dismal and the research and teaching institutions were in embryonic stage. That had an impact on the level of literacy and a hurdle for getting into the new vocations. Fifth, the technology was primitive and provided very low yields per hectare. There were no avenues to develop the technology, either. Sixth, market imperfections infested the agriculture produce markets as also factor markets. Farmers remained at the receiving end in both markets and were harshly exploited by the market operators. Last, there was no clear blueprint available from the government in the form of a long-run agricultural development policy, nor were there any attempts to get one of that sort. Indian agriculture took its journey with these heavy constraints. In 1947, Jawaharlal Nehru said the famous quote, with loaded passion, that "everything else can wait, but not agriculture." History, however, tells us that, in reality, it turned out to be the other way around till 1966-67, when everything else was taken care of on the policy front except agriculture. Indian agriculturists had to wait until 1999 for an independent exclusive policy statement. The Planning Commission and other think tanks only undertook the firefighting through ad hoc schemes.

During the last 65 years, the share of the agricultural sector to the total GDP has come down from 52.6 per cent in TE (Triennium Ending) 1952-53 to 11.8 per cent in TE 2015-16. This decline of 41 per cent points is not very secular and is marked by fluctuations. The share of the agricultural sector in the total GDP declined by about 5-6 per cent points in every triennium till the 1990s, and suddenly, this decline between TE 1992-91 and TE 2002-03 doubled, reaching a record of 8 per cent. This was indeed an unprecedented decline in the share of GDP. A similar fall was noticed, though at a slower rate, in the share of the agricultural workforce

out of the total workforce. Initially, this decline was of the order of 1 to 4 per cent in every TE. Still, again during TE 1992-93 and TE 2002-03, the decline in the share of agricultural workforce to total workers was 10 percent points. That marks a structural break in Indian agriculture during 1992-03 and 2002-03. This change in the structure of agriculture was quite significant and is reflected in many other indicators, too. This was the decade that brought down the primacy of agriculture in the Indian economy. Indian economy and agriculture entered the international trade arena without proper ground preparations.

The travelogue of Indian agriculture depicts a staggered approach and lack of any long-term focus. Every phase began to deal with some of the current issues but ended with a few new problems. As a result, we were stranded at a crossroads for decades with little positive movement. The reasons for the jagged roads are twofold: the challenging ground conditions that are arduous and worsen over time. The Commission appointed under the independent Evaluation authority of the Planning Commission appointed by the UPA Government under Dr Ajay Chhibber remarked, "Since the Planning Commission has defied attempts to reform it to bring it in line with the needs of a modern economy and the trend of empowering the States, it is proposed that the Planning Commission be abolished" (GoI, 2014, p10). The second, the failure of policy to read these conditions and their inter-play, has been enhancing the difficulties. No clear developmental model emerged from our efforts in the agriculture sector; rather, policy was defined as a problem-solving instrument. The firefighting approach ended up dishing out new schemes that did not have any long-term development thinking behind them.

The agrarian distress prevailing in India since the late 1990s and continues over the last two decades raises quite a few questions. Are the farmers really unhappy, and have we been doing enough for the farm sector and the incomes of the farmers? A full review of the picture does not give very satisfactory answers. Even whether the economy's growth percolated to the agriculture sector opens up a dreadful reality. The Government of Karnataka in 2009 had taken steps to revisit the methodology of computing growth on a fi, five-year rolling growth model. Clearly, we have not crossed the 3.2% barrier for long in the agricultural sector. Besides, the structure of agriculture in the country has been changing fast. The culture of agriculture itself is coming under the shadow and changing fast towards a mutated new commercial culture unsuitable with the given institutional setup. The changes in the agriculture sector have taken sharp turns during the last two decades with the process of liberalisation. According to the Population Census 1991 and 2011, 50 lakh cultivators have disappeared, and the number of agricultural labourers has increased. Villages are changing rapidly as hinterlands of the urban economy. The reverse dependence has become prominent, and commercialisation is the vehicle through which this is strengthened. Farm sector distress is visible in every region of the country and is responded to by the policy in packages rather than getting at the root of the problem. Loan waivers and incidental help to the farm sector have overshadowed any long-term policy thinking. Since 1986, India has had no price policy to guide us in the agricultural market or price fixation. It is here that the problem of distress begins and ends. The cascading effect is quite strong, and ironically, the farmer has become more of a political coin than an important economic entity in the country contributing towards its development. The lack of long-term policy and understanding of the agricultural policy is causing strong negative externalities (Coleman et al., 1997). We need to deal with these, which are the foundations of the jagged texture of the crossroads. Dealing with this phenomenon is the major challenge.

Annexure Table 1.1: Major Indicators of Performance of Indian Agricultural Sector

		Unit	TE 1952-53	TE 1960-63	TE 1972-73	TE 1982-83	TE 1992-93	TE 2002-03	TE 2012-13	2015-16 (AE)
1	Share of Agricultural Sector in GDP	%	51.6	46.1	40.2	35.1	29.0	21.6	15.0	11.8
2	Share of Agricultural Workers in Total Workers~	%	72.1	71.8	72.1	68.5	66.9	56.9	54.6	-
3	Foodgrain Production	Million Tonnes	54.0	81.6	103.5	130.8	174.8	194.8	253.6	252.22
4	Foodgrain Yield	Kg/ha	541.1	698.4	847.8	1030.2	1406.3	1631.7	2045.7	2056.0
5	Cropping Intensity	%	111.4	115.0	118.0	123.4	129.6	132.2	139.1	$142.0
6	Irrigation Intensity	%	109.6	114.2	122.4	127.6	132.0	137.1	139.8	$140.6
7	Gross Irrigated Area to GCA	%	17.1	18.4	23.5	29.3	35.3	41.6	46.5	$ 47.7
8	Net Irrigated Area to NSA	%	17.4	18.6	22.6	28.3	34.7	40.1	46.3	$48.1
9	Area Share of Foodgrain to GCA	%	76.3	75.4	74.8	73.3	67.9	66.2	63.1	$62.3
10	Area Share of Horticultural Crops* to GCA	%	3.3	3.5	4.3	5.1	6.3	7.9	8.1	$8.7
11	Area share of Core Commercial crops** to GCA	%	15.4	16.5	16.7	16.9	21.4	21.4	24.0	$25.6
12	Share of foodgrains in total crop output	% (2004-05 prices)	40.3	42.9	41.7	40.0	41.3	36.1	33.6	-
13	Share of Horticulture*** in total crop output	% (2004-05 prices)	31.9	26.1	38.2	38.9	39.6	52.7	56.3	-
14	Share of core commercial crops** in total crop output	% (2004-05 prices)	18.2	19.2	18.1	17.3	20.3	16.5	20.3	-
15	Consumption of Pesticides (Technical Grade Material)	1000 MT	2.5	8.6	29.7	47.3	72.7	46.3	51.4	50.4
16	Consumption of Fertilizers (NPK)	Kg per Ha	0.5	2.3	15.4	34.4	67.6	90.7	138.5	130.7
17	Distribution of Certified/ quality Seeds	Lakhs qtles	-	-	-	44.2	58.1	92.0	295.2	304.4

		Unit	TE 1952-53	TE 1960-63	TE 1972-73	TE 1982-83	TE 1992-93	TE 2002-03	TE 2012-13	2015-16 (AE)
18	Electricity Consumption for agricultural purposes	Gwh	-	-	-	17812	57402	83629	^133668	168913
19	Tractors /Pump sets per ha (respectively)	Per '000' ha	-	0.03/5	-	3.7/49	8.6/79	13/111	-	-
20	Gross Capital Formation as % to Agricultural GDP	% (current prices)	3.9	4.8	5.9	8.1	7.4	11.8	16.3	$15.8
21	Gross Capital Formation as % to GDP	% (current prices)	2.0	2.0	2.4	2.8	2.2	2.6	2.90	$2.40
22	Trade in Agricultural Commodities (Exports &Imports)	₹. Crore	-	-	-	-	9484	46331	262299	355684
23	Exports of agricultural Commodities	₹. Crore	-	-	-	-	7630	31013	179045	215396
24	Public Exp on agricultural research and extension@@	% GDP	-	0.30	0.23	0.50	0.55	0.65	^^0.65 (0.73)	0.070

*Note - * Condiments & Spices, Fruits & Veg, Plantation crops; ** Total Oilseeds, Sugarcane, Total Fibre and Tobacco; ****condiments & Spices, Fruits & Veg, Plantation and floriculture & other horticulture crops; ₹@ allied sector excluded forestry and fisheries output; ~Census years; ^TE2011-12; $2013-14; ₹@@ & ^^TE 2005-06 from Balakrishnan, Golait and Kumar (2008) & figures in bracket " for TE 2010-11 (source - Singh and Pal 2011); Balakrishnan, P., Golait, R. and Kumar, P (2008), "Agricultural Growth in India since1991", Study No. 27, Development Study Group, Reserve Bank of India, Mumbai.*

Annexure 1.2: Plan period Policy Changes

Plan Period	Major Issues and Policy Thrust
First Plan **1951-56**	• Severe food availability constraints. • Maximisation of Agricultural Production. • Making Food available to masses. • Food distribution network. • Nationwide Community Development (CD) Programme Institutions for village development. • National Extension and Community Projects Skewed Land Distribution, • Inefficiency in Production and thus land reforms - Abolition of intermediaries. • Bringing the fallow lands under cultivation and increase in land use efficiency. • Tenants to be given the rights to cultivate land.

Plan Period	Major Issues and Policy Thrust
Second Plan **1956-61**	• Concern about low land productivity and thrust on irrigated agriculture. • Irrigation Development for the rainfed areas. • Land Reforms Enactment of laws. Tenancy Reforms & Ceiling on Holdings. • Soil conservation as an important programme. • Co-operative Development Institutions, National Extension Service Blocks created. • Training and Extension work for the technology through Community Development network.
Third Plan **1961-66**	• Food security concerns continued to dominate. • Technological Change and adoption of improved technology to increase land productivity. • Cultivable waste land to be brought under cultivation. • Brining the lagging regions under mainstream growth.
	• Area development as an approach for development. • Intensive Area Development Programme adopted for selected districts. • Extension of non-agricultural activities in Rural areas. • An integrated land policy approach. Soil Surveys were taken up.
Fourth Plan **1969-74**	• Emphasis on food security continued as minimum dietary requirements to be met. • Deep concern about Poverty. • Regional inequality and correction of regional imbalances. • Incentives created for land diversion towards food crops and enhancing the capacity of such land. • Increased emphasis on irrigation and soil conservation in dry-land regions and technological change introduced. • Higher cropping intensity was the concern. • Emergence of Agri. Price Policy. • Concern about domination of large holding sizes and low allocative and technical efficiency. • Second phase of land reforms with land ceiling acts and consolidation of holding. • Encouragement to co-operatives. Institutional changes in Credit, Agri extension and training.

Plan Period	Major Issues and Policy Thrust
Fifth Plan **1974-79**	• Twenty point economic programme. • Concern to eradicate poverty intensified. • Area Development strategy continued. • Drought prone areas attracted attention. • Allocation on Drought-prone area development programme, Desert area development programmes, and soil conservation was enhanced. • New impetus to dry farming. • Problems of land degradation land management in irrigated command areas surfaced. • Modernisation of irrigation in selected irrigation command areas.
Sixth Plan **1980-85**	• Minimum Needs Programme. • Providing clean drinking water, elementary education and basic health facilities. • Larger attention to unemployment and under-employment. • Target group specific programmes for poverty alleviation. IRDP, NREP and RLEGP Programmes were undertaken for employment and income generation. Under-utilisation of land resources. • Drought-prone areas continued to attract attention. • Further attention for lagging areas on the backdrop of green revolution. • Land and water management programme under drought-prone area programme in selected districts.
Seventh Plan **1985-90**	• Direct attack on poverty, unemployment and regional imbalances continued. • Soil erosion and land degradation surfaced as major issues. • Larger share of land was going out of cultivation. • Soil and Water Conservation was needed for averting land degradation. • National Watershed Development Programme, Oilseed and Pulses Development Programmes, Wasteland Development Programmes, and Long term view of land management was initiated.
Eighth Plan **1992-97**	• Priority for Employment Generation, Strengthening of Infrastructure, Liberalisation and Globalisation in Agricultural Sector. • Trade Sector Priorities by Generating Surplus of agricultural commodities for exports. • Emphasis on Oilseed Sector increased. • Agro-climatic regional planning approach was incorporated. • Productivity enhancement Schemes.

Plan Period	Major Issues and Policy Thrust
	• Horticulture Sector to be encouraged. • Degradation of land in Irrigated command areas attracted attention. Peoples' participation surfaced as major issue in land management at village level. • Emphasis on Watershed Development approach. • Soil conservation merged with watershed programmes.
Ninth Plan **1997-2002**	• Priority to agricultural sector. • Generating adequate productive employment through employment assurance. • Renewed assault on poverty, • Accelerating growth with stable prices, • Food and nutritional security for vulnerable sections, • Providing basic needs for environmental sustainability, • Growth with social justice and equity, • Foreign trade to be tailored for accelerating growth, • Boost to agricultural research, • Development of infrastructure and increasing investment in infrastructure, • Export oriented growth and Emphasis on Horticultural Crops for exports. • Integrating Watershed Development Programme across various components. Rethinking on land reforms. • Gap between potentials and actual crop yields need to be bridged. • Need for a long-term policy document. • Bringing the under-utilised land under cultivation. • Management of waste lands. Maintenance of village commons. • Decentralised land management system. Panchayat raj institutions to manage the village lands. Rethinking on land legislation
Tenth Plan **2002-2007**	• Creation of employment; • Improving pace of growth in agriculture; • Sustaining demand for labour; Employment Generation programmer to concentrate in Diversification of Agriculture and Agro Processing; • Land use policy; • Process oriented programmes focussing on poor; • Universalisation of Joint Forest Management or macro management approach; • precision farming; • Organic farming;

Plan Period	Major Issues and Policy Thrust
	• wastelands to be brought under economic use; • Strengthening R and D for slow growth crops.
Eleventh Plan **2007-2012**	• Inclusive growth,Agricultural target at 4.1 percent per annum • Emphasis on Public-Private partnership. • District specific Agricultural Plans • Addressing Climatic Variability • Research and Development for increasing productivity • Prominence to rainfed agriculture • Emphasis on biotechnology.
Twelfth Plan **2012-17 (Dropped)**	• Strongly Inclusive Growth @ 8% • Policy restructuring, clearing the 'Logjam'. • Connecting Policies and Public Programmes. Implementation Focus • Connecting different stake holders. • Scenario Analysis, Agri to grow at 4% • Adaptation to Climatic Variability

Source: *Author's earlier work. Compiled from various plan documents. These are however not exhaustive statements but only indicative of the thrust areas.*

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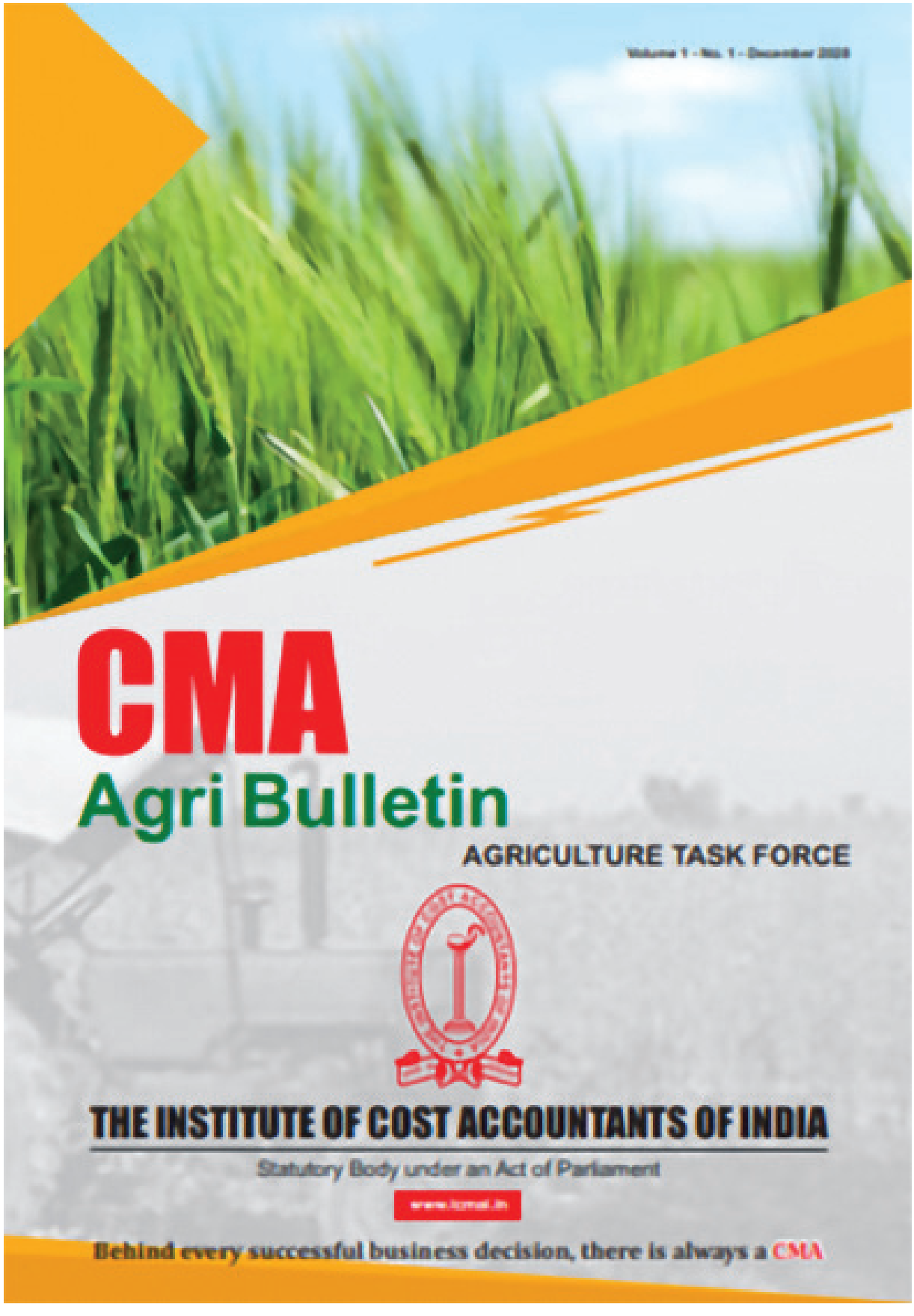

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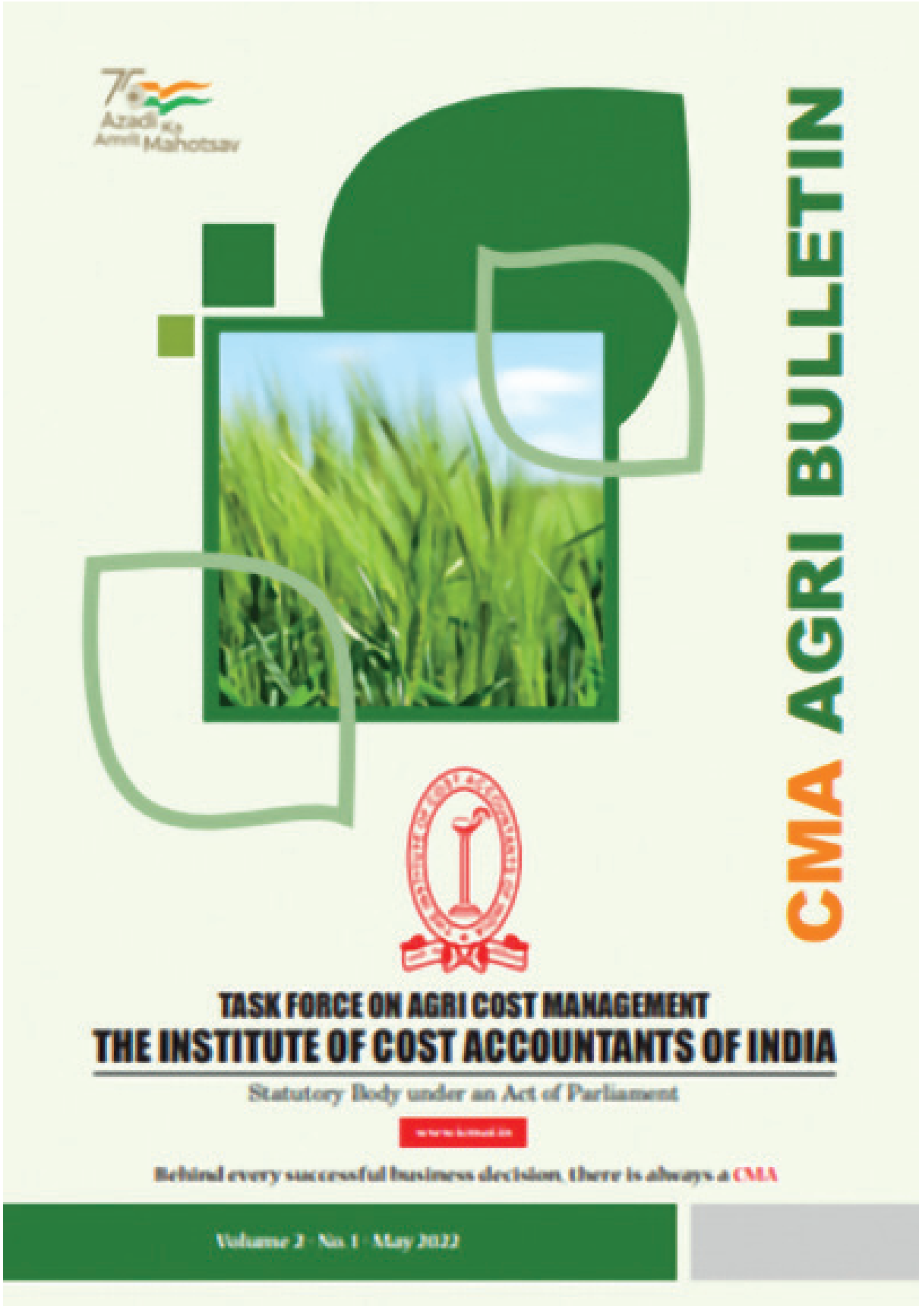

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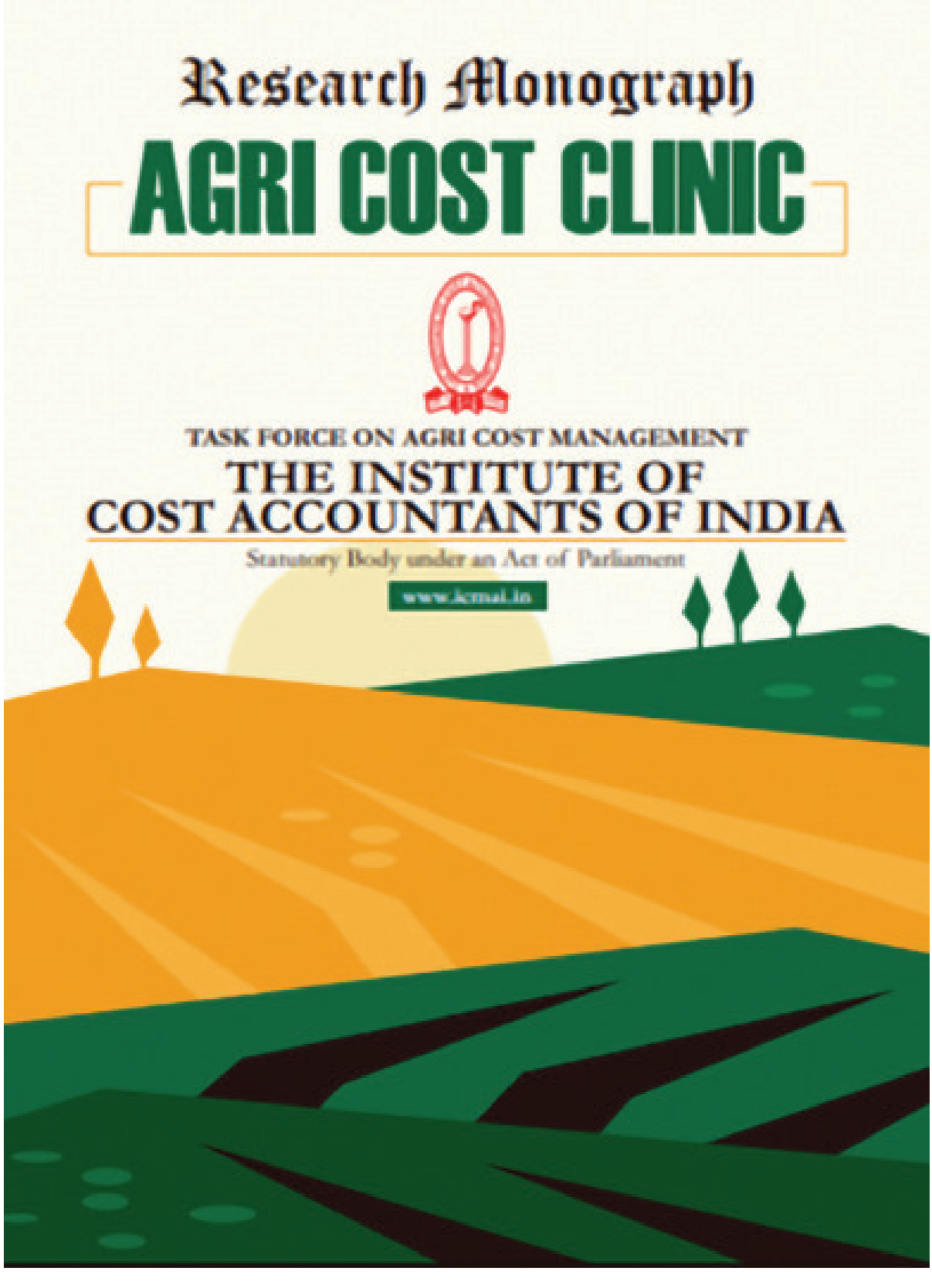

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