



Evaluating the Role of Central Government Programs in Promoting Agricultural Development and Farmer Well-Being in India

Dr. J Suresh Kumar ^{1*}, Dr. D Shobana ²

¹ Associate Professor, Department of Economics, St. Joseph University, Chümoukedima, Nagaland, India

² Assistant Professor, Department of Commerce and Management Studies, St. Joseph University, Chümoukedima, Nagaland, India

* Corresponding Author: Dr. J Suresh Kumar

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Abstract

India's agricultural sector, a crucial component of the country's economy, has faced persistent challenges, including low productivity, fragmented landholdings, and vulnerability to climate change. In response, the Government of India has launched various schemes aimed at promoting agricultural development and enhancing farmer welfare. This study evaluates the impact and effectiveness of key central government schemes, such as the Pradhan Mantri Fasal Bima Yojana (PMFBY), Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), and the National Mission for Sustainable Agriculture (NMSA). By analyzing their design, implementation, and outcomes, this paper explores the extent to which these schemes have contributed to improving agricultural productivity, income security, and climate resilience.

The Pradhan Mantri Fasal Bima Yojana has provided critical financial support to farmers during crop failures caused by natural calamities, though challenges such as delays in claim settlements remain. Similarly, PM-KISAN's direct income support to small and marginal farmers has helped reduce financial distress, but concerns about its long-term viability continue. The National Mission for Sustainable Agriculture has encouraged resource-efficient and climate-resilient farming methods, yet uneven adoption across regions highlights the need for more localized implementation. The findings point to both achievements and areas for improvement, offering recommendations to enhance the effectiveness and reach of these important initiatives.

Keywords: Agricultural Development, Farmer Welfare, Central Government Schemes, PMFBY, PM-KISAN and NMSA

Introduction

India's agricultural sector plays a pivotal role in ensuring food security and sustaining the livelihoods of nearly 60% of the population (Singh *et al.*, 2019) ^[25]. However, the sector faces numerous challenges, including low productivity, fragmented landholdings, and the growing impacts of climate change. Small and marginal farmers, who constitute a majority of the farming community, are particularly vulnerable to economic shocks and environmental uncertainties. To address these challenges and promote sustainable agricultural growth, the Government of India has implemented several central schemes aimed at improving agricultural productivity, enhancing income security, and building resilience against climate risks (Kumar & Mishra, 2020) ^[16]. Prominent among these schemes are the Pradhan Mantri Fasal Bima Yojana (PMFBY), a crop insurance program designed to protect farmers against crop failure due to natural disasters; the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), which provides direct income support to small and marginal farmers; and the National Mission for Sustainable Agriculture (NMSA), focused on promoting resource-efficient and climate-resilient farming practices (Sharma & Singh, 2021) ^[22]. These schemes represent critical interventions aimed at transforming the agricultural sector and improving the welfare of farmers, but their effectiveness remains a subject of ongoing debate. While these schemes have delivered notable benefits, such as financial protection and increased income for farmers, concerns persist regarding their implementation, particularly in terms of accessibility, timely disbursement, and regional disparities in their impact (Tiwari & Kumar, 2020) ^[27].

This paper seeks to evaluate the impact and effectiveness of these central government schemes, examining their successes and shortcomings, and offering insights into how they can be strengthened to achieve sustainable agricultural development and improved farmer welfare in India.

Review of the Literature

The Government of India has implemented a series of central schemes aimed at improving agricultural productivity, ensuring farmer welfare, and building climate resilience. This review synthesizes existing literature on the impact and effectiveness of major schemes such as the Pradhan Mantri Fasal Bima Yojana (PMFBY), Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), and the National Mission for Sustainable Agriculture (NMSA).

The PMFBY, launched in 2016, is one of the flagship schemes aimed at providing crop insurance to farmers in the event of natural disasters. Sharma and Singh (2021)^[22] conducted an evaluation of PMFBY's performance and found that while the scheme has offered substantial financial protection to farmers during crop losses, several challenges persist. These include delays in claim settlements, lack of transparency in loss assessment, and difficulties in enrolment, particularly for small and marginal farmers. Despite these shortcomings, the authors concluded that PMFBY has the potential to mitigate agricultural risks and stabilize farmers' incomes if its implementation is streamlined.

Other studies have highlighted the need for technological integration to improve the efficiency of PMFBY. According to Kumar and Sharma (2020)^[11], digital tools such as remote sensing and mobile applications for real-time loss assessment could significantly enhance the accuracy of claims processing, thus improving farmer satisfaction. However, the adoption of such technology has been limited due to poor infrastructure and low digital literacy among rural farmers.

PM-KISAN, launched in 2019, provides direct income support to small and marginal farmers to ease financial stress and promote agricultural investments. Kumar *et al.* (2020) found that PM-KISAN has had a positive impact on farmers' financial security, particularly during economic downturns. The scheme has been effective in reducing short-term debt and improving farmers' ability to invest in inputs like seeds and fertilizers. However, the study also noted that the scheme's coverage is uneven, with many eligible farmers unaware of the program or unable to access the benefits due to administrative hurdles.

While PM-KISAN has been praised for its straightforward cash transfer mechanism, critics have pointed out its limitations in addressing long-term agricultural challenges. Mishra and Verma (2021)^[16] argue that while direct income support is essential, the scheme needs to be complemented by policies that improve market access, infrastructure, and technological adoption to ensure sustainable agricultural growth.

The NMSA, part of the National Action Plan on Climate Change (NAPCC), focuses on promoting sustainable and climate-resilient agricultural practices. According to Tiwari and Kumar (2020)^[27], the NMSA has played a vital role in encouraging farmers to adopt resource-efficient practices such as micro-irrigation, integrated nutrient management, and drought-resistant crop varieties. The mission's initiatives, such as the Soil Health Card (SHC) scheme and the Per Drop More Crop program, have shown promising results in improving soil health and water-use efficiency.

Despite these successes, the effectiveness of NMSA has been hampered by regional disparities in adoption and limited access to necessary resources, particularly among small and marginal farmers (Singh & Singh, 2018)^[25]. Additionally, Bhattacharya and Pal (2017)^[2] pointed out that a lack of adequate infrastructure and financial support has restricted the widespread adoption of climate-resilient technologies in many regions. The authors emphasized the need for localized strategies and increased government investment to ensure that NMSA initiatives reach all farmers.

The literature indicates that while central government schemes like PMFBY, PM-KISAN, and NMSA have made significant contributions to agricultural development and farmer welfare, challenges remain in their implementation. Delays in financial disbursements, uneven access, and regional disparities hinder the full potential of these programs. Future policy efforts must focus on improving infrastructure, enhancing farmer awareness, and incorporating localized strategies to address the diverse needs of India's farming communities.

Objectives of the Study

1. To evaluate the role of major central government schemes on agricultural productivity and rural economic development in India.
2. To assess the effectiveness of schemes such as PM-KISAN, PMFBY, Soil Health Card, and others in improving farmer income, welfare, and risk mitigation.
3. To identify the implementation challenges and bottlenecks faced by farmers in accessing scheme benefits.
4. To analyze the role of institutional and policy support in promoting sustainable agriculture and inclusive growth.
5. To suggest policy recommendations for enhancing the outreach, efficiency, and impact of agricultural development schemes in India.

Research Methodology

This study adopts a secondary data-based research methodology to evaluate the impact and effectiveness of central government schemes on agricultural development and farmer welfare in India. Data has been sourced from government reports, policy documents, scheme guidelines, academic studies, and statistical databases such as those of the Ministry of Agriculture, NITI Aayog, and NABARD. The research involves qualitative and comparative analysis of scheme objectives, implementation mechanisms, and outcomes to assess their role in enhancing agricultural productivity and farmer well-being.

Results and Discussion

The analysis reveals that central government schemes have positively influenced agricultural productivity, income stability, and climate resilience. Schemes like PM-KISAN and PMFBY have supported small farmers through direct income and risk mitigation. However, issues such as delayed implementation, regional disparities, and limited awareness hinder their full impact. Strengthening delivery mechanisms and localized approaches can enhance their effectiveness further.

Central Government Schemes on Agricultural Development and Farmer Welfare in India

The Government of India has introduced various central

schemes aimed at promoting agricultural development and improving the welfare of farmers. These schemes are designed to boost agricultural productivity, ensure food security, provide financial assistance, and improve the living conditions of farmers.

1. **Pradhan Mantri Kisan Samman Nidhi (PM-KISAN):** The Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) aims to provide financial support to small and marginal farmers. Launched in December 2018, it offers ₹6,000 annually in three equal installments, directly credited to the beneficiaries' bank accounts. The scheme benefits eligible farmers owning up to 2 hectares of cultivable land, helping sustain their agricultural activities and livelihood.
2. **Pradhan Mantri Fasal Bima Yojana (PMFBY):** The Pradhan Mantri Fasal Bima Yojana (PMFBY), launched in 2016, provides crop insurance to farmers against losses caused by natural calamities, pests, or diseases. It offers coverage at low premium rates, with the majority of the cost subsidized by the government. The scheme aims to minimize farmers' financial risk and ensure stability in their agricultural income.
3. **Soil Health Management (SHM) Scheme:** The Soil Health Management (SHM) Scheme, launched under the National Mission on Sustainable Agriculture (NMSA), aims to improve soil fertility and encourage sustainable farming. It emphasizes regular soil testing, promotion of organic farming, and capacity building of farmers. By providing essential resources and knowledge, the scheme helps ensure long-term agricultural productivity and environmental conservation.
4. **National Mission for Sustainable Agriculture (NMSA):** The National Mission for Sustainable Agriculture (NMSA), launched in 2014, aims to promote sustainable farming practices that enhance productivity, improve soil health, and protect the environment. It focuses on organic farming, efficient water use, nutrient management, and integrated farming systems. NMSA supports conservation agriculture to ensure long-term sustainability and resilience in Indian agriculture.
5. **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** The Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), launched in 2015, aims to provide irrigation to every farm and enhance water use efficiency. It integrates initiatives like the Accelerated Irrigation Benefit Programme (AIBP) and the National Mission on Micro Irrigation (NMMI). The scheme promotes "Per Drop More Crop" by expanding irrigation infrastructure and encouraging efficient water management.
6. **Rashtriya Krishi Vikas Yojana (RKVY):** The Rashtriya Krishi Vikas Yojana (RKVY), launched in 2007, aims to ensure holistic development of the agriculture sector. It provides states with the autonomy to design and implement need-based agricultural programs. The scheme supports crop productivity enhancement, infrastructure development, and financial aid for diverse agricultural activities, thereby strengthening state-level agricultural planning and farmer support systems.
7. **Pradhan Mantri Annadata Aay SanraksHan**

Abhiyan (PM-AASHA): The Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA), launched in 2018, aims to ensure farmers receive fair and remunerative prices for their produce. It includes components like the Minimum Support Price (MSP), Price Support Scheme, and Private Procurement & Stockist Scheme. PM-AASHA protects farmers from distress sales and market volatility, thereby stabilizing their income and livelihoods.

8. **National Agriculture Market (e-NAM):** The National Agriculture Market (e-NAM), launched in 2016, is an online trading platform designed to create a unified national market for agricultural commodities. It connects physical mandis across India, enabling farmers to sell their produce through transparent, competitive bidding. By reducing the role of middlemen, e-NAM enhances price realization, market access, and efficiency in agricultural marketing.
9. **Kisan Credit Card (KCC) Scheme:** The Kisan Credit Card (KCC) Scheme, launched in 1998, aims to provide farmers with timely and affordable credit for their agricultural needs. It offers both short-term and long-term loans for activities such as crop production, irrigation, and allied services. The scheme enhances farmers' access to institutional credit, reduces dependence on informal sources, and ensures timely input procurement.
10. **Agriculture Infrastructure Fund (AIF):** The Agriculture Infrastructure Fund (AIF), launched in 2020, aims to provide financial assistance for the development of agricultural infrastructure. It supports projects such as cold storage, warehousing, and processing units, helping to reduce post-harvest losses, strengthen food supply chains, and boost value addition. The scheme promotes private investment and modernizes infrastructure to enhance farmers' income and efficiency.
11. **Paramparagat Krishi Vikas Yojana (PKVY):** The Paramparagat Krishi Vikas Yojana (PKVY), launched in 2015, aims to promote organic farming across India. It adopts a cluster-based approach to encourage groups of farmers to transition to organic methods. The scheme provides support for organic certification, training, input management, and marketing of organic produce, thereby ensuring sustainable agriculture and better market access for organic farmers.
12. **Sub-Mission on Agricultural Mechanization (SMAM):** The Sub-Mission on Agricultural Mechanization (SMAM), launched in 2014, aims to enhance farm productivity by promoting the use of modern agricultural machinery. The scheme provides financial assistance to farmers for purchasing equipment such as tractors, harvesters, and other implements. SMAM helps reduce manual labor, improves efficiency, and supports the modernization of agricultural practices across India.
13. **Bhartiya Prakritik Krishi Paddhati (BPKP):** The Bhartiya Prakritik Krishi Paddhati (BPKP), launched in 2020, aims to promote natural and eco-friendly farming practices. It encourages traditional agricultural methods

- with minimal use of chemicals and synthetic fertilizers. BPKP focuses on enhancing soil health, preserving biodiversity, and ensuring long-term sustainability of farming by reducing input costs and improving environmental resilience in agriculture.
- 14. Fisheries and Aquaculture Infrastructure Development Fund (FAIDF):** The Fisheries and Aquaculture Infrastructure Development Fund (FAIDF), launched in 2018, aims to strengthen fisheries and aquaculture infrastructure in India. It provides financial assistance for developing facilities related to fish production, processing, storage, and marketing. FAIDF supports sustainable growth of the fisheries sector, enhances fishers' incomes, and contributes to the government's objective of doubling farmers' income through allied activities.
- 15. National Mission on Agricultural Extension and Technology (NMAET):** The National Mission on Agricultural Extension and Technology (NMAET), launched in 2014, aims to enhance the reach and quality of agricultural extension services in India. It focuses on bridging the gap between research and practice by disseminating modern farming technologies and

- practices. The mission promotes the use of ICT tools, capacity building, and farmer advisory services to improve productivity and sustainability.
- 16. Bharatiya Pradhan Mantri Gram Sadak Yojana (PMGSY):** The Pradhan Mantri Gram Sadak Yojana (PMGSY), launched in 2000, aims to improve rural infrastructure by providing all-weather road connectivity to remote villages. This enhances farmers' access to markets, reduces transportation time and post-harvest losses, and supports the overall development of the rural economy. PMGSY plays a vital role in linking agricultural production with market opportunities.

Effectiveness of Agricultural Schemes in India

India's agricultural sector is vital to the country's economy and rural livelihoods, yet it faces challenges like low income, climate risks, and resource inefficiencies. To address these issues, the government has introduced various schemes aimed at improving productivity, ensuring income support, and enhancing sustainability. This study explores the impact and effectiveness of these schemes on farmer welfare and agricultural development.

Table 1: Performance of Key Agricultural Schemes in India

Scheme	Key Objective	No. of Beneficiaries (in crore)	Total Fund Allocated (₹ Cr)	Reported Outcomes	Challenges
PM-KISAN	Income support to small & marginal farmers	11.8 (FY 2023-24)	₹60,000+ (cumulative)	Increased liquidity, improved input access	Fixed amount, no inflation adjustment
PMFBY	Crop insurance against yield loss	5.6 (Kharif 2023)	₹13,625 (FY 2023-24)	Risk coverage for weather and pest losses	Low claim settlement speed, limited reach
Soil Health Card	Improve soil quality & balanced fertilization	22.5 (Phase I & II)	₹768 (till 2023)	Improved crop yield & cost efficiency	Low awareness, poor follow-up
Kisan Credit Card (KCC)	Easy access to credit	7.3 active users (2023)	₹16,800 (credit flow target FY 2023-24)	Reduced informal lending	Documentation issues
e-NAM	Digital marketing platform for farmers	1.8 crore farmers	₹700+ (since 2016)	Better price discovery, inter-state trade	Low internet access, mandi integration

Source: Ministry of Agriculture and Farmers Welfare; PMFBY Dashboard; e-NAM Portal; Budget 2023-24 Documents

Table 1 provides a comparative analysis of major agricultural schemes in India based on their objectives, beneficiary reach, fund allocation, outcomes, and challenges. PM-KISAN, with over 11.8 crore beneficiaries, has improved cash flow among small farmers, though the fixed amount lacks inflation adjustment. PMFBY has extended crop insurance to 5.6 crore farmers, offering protection against climatic and pest-related losses; however, delays in claim settlement and limited penetration affect its impact. The Soil Health Card scheme, with 22.5 crore cards issued, has enhanced crop productivity and reduced input costs, yet struggles with awareness and follow-up. The Kisan Credit Card (KCC) has helped 7.3 crore farmers access formal credit, reducing reliance on informal lenders, although procedural barriers remain. Meanwhile, e-NAM has enabled 1.8 crore farmers to engage in transparent, digital trade, promoting better price realization and interstate market linkages, but faces issues like low digital literacy and

inadequate mandi integration. Overall, while these schemes address different aspects of agricultural development income, risk, productivity, credit, and market access their effectiveness is often constrained by implementation gaps, awareness issues, and infrastructural challenges. Greater coordination, digital inclusion, and field-level support can significantly enhance their collective impact on farmer welfare. The chart highlights the diverse performance of key agricultural schemes in India, reflecting varying levels of reach and investment. The Soil Health Card Scheme stands out with the highest number of beneficiaries (22.5 crore) despite minimal funding, indicating wide outreach but possibly limited per-capita support. PM-KISAN, with substantial financial allocation (₹60,000+ crore), supports 11.8 crore farmers through direct income transfer, enhancing liquidity and input access.

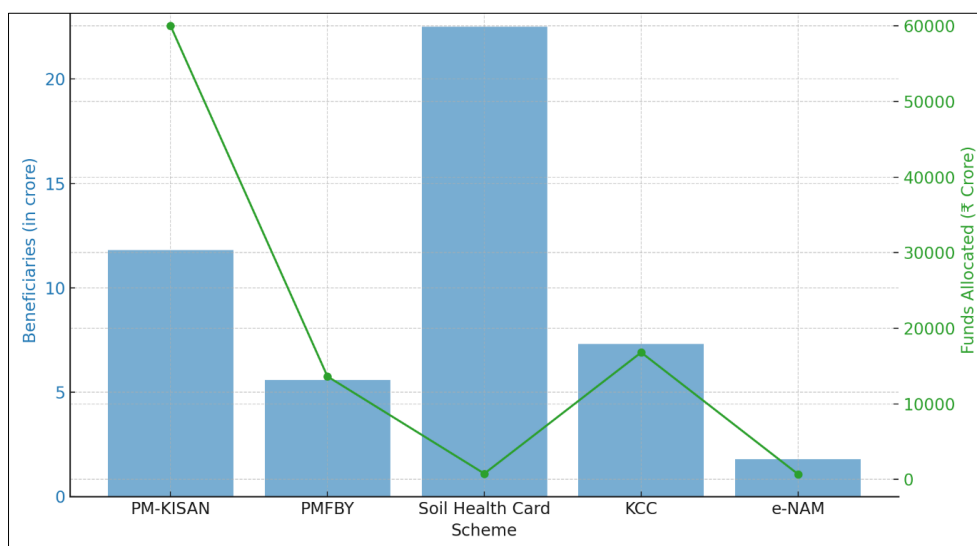


Fig 1: Performance of key agricultural schemes in India

The Kisan Credit Card (KCC) scheme also shows balanced performance, offering affordable credit to 7.3 crore farmers. Meanwhile, PMFBY provides critical crop insurance to 5.6 crore farmers but faces challenges in claim settlement despite significant funding. e-NAM, though progressive in intent, remains limited in impact with only 1.8 crore users and low investment, suggesting infrastructural and digital barriers. Overall, the chart reflects the need for better alignment between beneficiary coverage, fund allocation, and scheme effectiveness to ensure inclusive and impactful agricultural development.

- 1. PM-KISAN (Pradhan Mantri Kisan Samman Nidhi):** The scheme provides a direct income support of ₹6,000 per year to small and marginal farmers, offering much-needed financial relief. Its timely payments have enhanced liquidity, enabling farmers to purchase essential inputs and serving as a safety net during lean agricultural seasons. However, the benefit amount remains modest and is not indexed to inflation or rising crop production costs, limiting its long-term impact on farmers' economic stability.
- 2. PMFBY (Pradhan Mantri Fasal Bima Yojana):** The scheme provides crop insurance to safeguard farmers against weather and production risks, helping to mitigate financial losses in the event of crop failure. While it offers crucial protection, delays in compensation and limited coverage among small farmers reduce its overall effectiveness. To enhance its impact, improvements such as a stronger grievance redressal mechanism, timely settlement of claims, and greater awareness among farmers are essential.
- 3. Soil Health Card Scheme:** The scheme assesses soil nutrient status and provides tailored fertilization recommendations to farmers. This has improved input use efficiency, resulting in better crop yields and significant cost savings. However, its effectiveness is constrained by limited farmer understanding of the recommendations and inadequate follow-up to ensure proper implementation.
- 4. e-NAM (National Agriculture Market):** The initiative offers a digital platform that facilitates transparent price discovery and improved market access for farmers. While it has strengthened market linkages in certain

regions, its overall progress is slowed by infrastructure gaps and limited adoption among farmers.

- 5. Kisan Credit Card (KCC):** The scheme ensures timely access to institutional credit, helping farmers meet their financial needs without resorting to high-interest moneylenders. While it has significantly reduced dependence on informal credit sources, some farmers still face challenges due to documentation requirements and barriers to inclusion.

The central government schemes collectively play a crucial role in strengthening India's agricultural ecosystem. PM-KISAN and KCC enhance income stability, PMFBY supports risk mitigation, Soil Health Card promotes productivity through better input use, and e-NAM improves market efficiency. However, persistent issues such as implementation bottlenecks, digital divide, and limited farmer awareness hinder optimal outcomes. Strengthening inter-scheme coordination, enhancing capacity building, and establishing robust monitoring mechanisms are essential to maximize the impact of these initiatives on farmer welfare and rural development.

Implementation Challenges Hindering Farmers' Access to Government Agricultural Schemes in India

Government agricultural schemes like PM-KISAN, PMFBY, Soil Health Card, and others aim to enhance farmer income, ensure risk coverage, and improve productivity. However, their effectiveness is often limited by implementation challenges. Issues such as lack of awareness, documentation hurdles, delayed payments, and weak infrastructure hinder farmers especially smallholders from fully accessing and benefiting from these initiatives.

- 1. Awareness and Information Gaps:** Marginal and tribal farmers often have limited awareness of government schemes, which restricts their ability to benefit fully from available support. This challenge is compounded by inadequate extension services and poor information dissemination in remote and rural areas. Additionally, the lack of digital literacy among many farmers hinders their access to online platforms such as the PM-KISAN portal and e-NAM, limiting their participation in modern agricultural initiatives.

2. **Documentation and Eligibility Issues:** Many farmers face difficulties in accessing government schemes due to the absence of essential land ownership documents, bank accounts, or Aadhaar linkages. Tenant farmers, sharecroppers, and women farmers are often excluded as a result of unclear or unrecognized land rights, further limiting their eligibility for institutional support.
3. **Technological and Infrastructure Barriers:** Poor internet connectivity and the lack of digital devices in rural areas significantly restrict farmers' participation in digital platforms such as e-NAM. Furthermore, the absence of essential market infrastructure, including storage facilities and grading or sorting units, hampers the platform's effectiveness in improving market access and price realization for farmers.
4. **Delays in Benefit Delivery:** Delayed payments under PM-KISAN often occur due to verification issues or incorrect bank details, affecting farmers' timely access to financial support. Similarly, under PMFBY, late or non-payment of insurance claims is common, largely resulting from delays in crop-cutting experiments and poor coordination among stakeholders, which undermines the scheme's reliability and effectiveness.
5. **Institutional and Administrative Challenges:** The effectiveness of agricultural schemes is often hampered by inadequate staffing and insufficient capacity-building of implementing agencies at the local level. Additionally, bureaucratic hurdles and multiple layers of verification lead to delays in processing and frequently result in the exclusion of deserving beneficiaries, reducing the intended impact of these programs.
6. **Financial Constraints:** Insufficient or delayed release of funds from the government often disrupts the timely rollout of agricultural schemes, reducing their effectiveness. Farmers also encounter challenges in accessing credit under the Kisan Credit Card (KCC) scheme due to stringent banking norms and low levels of financial literacy, which limit their ability to benefit from institutional credit facilities.
7. **Follow-up and Monitoring Deficiency:** Weak monitoring and feedback mechanisms hinder timely corrections and necessary policy improvements in agricultural schemes. In the case of the Soil Health Card program, the lack of consistent follow-up on recommendations significantly reduces its effectiveness and limits the potential benefits for farmers.
8. **Social and Regional Disparities:** A significant gender gap persists in the access to agricultural schemes, with women farmers often excluded due to social and legal constraints. Additionally, regional disparities in implementation remain a challenge, particularly in North Eastern and hilly states, where geographical and infrastructural limitations hinder the effective delivery of these programs.
Despite well-intentioned policies, the full potential of these schemes is not realized due to systemic challenges. To address these, capacity building, digitization with inclusivity, simplified processes, and stronger last-mile delivery mechanisms are essential.

The Role of Institutional and Policy Support in Promoting Sustainable Agriculture and Inclusive Growth
Agriculture in India is not only a means of livelihood for a majority of rural households but also a foundation for food

security and inclusive development. However, sustainable agricultural growth and the inclusion of marginalized farming communities require robust institutional frameworks and supportive policy environments.

1. **Enhancing Sustainability through Policy Interventions:** Government policies such as the National Policy for Farmers (2007) and the National Mission on Sustainable Agriculture (NMSA) encourage sustainable practices including soil health management, rainwater harvesting, climate-resilient cropping, and organic farming. Complementing these efforts, state-level agro-climatic planning aligns crop choices and inputs with regional ecological conditions, helping reduce environmental degradation and dependency on external inputs.
2. **Strengthening Agricultural Research and Extension:** The Indian Council of Agricultural Research (ICAR) and state agricultural universities play a vital role in research and development of sustainable technologies, including pest-resistant seeds and water-saving techniques like drip irrigation. Supporting this, Krishi Vigyan Kendras (KVKs) provide location-specific advisory services, conduct on-farm demonstrations, and offer capacity-building programs to effectively bridge the gap between laboratory innovations and field-level adoption.
3. **Promoting Farmer Institutions:** Cooperatives, Farmer Producer Organizations (FPOs), and community-based organizations strengthen farmers by enabling collective procurement of inputs, as well as joint storage, processing, and marketing, thereby reducing costs and enhancing returns. Supportive measures such as the FPO Policy 2020 and equity grants further help formalize and expand these institutions, fostering rural enterprise development and improving farmers' market competitiveness.
4. **Inclusive Financial Support:** Institutional credit systems, supported by the RBI, NABARD, and commercial banks, provide farmers with subsidized loans, insurance, and working capital through initiatives such as the Kisan Credit Card scheme. Complementing this, the Agriculture Infrastructure Fund (AIF) promotes capital investment in essential facilities like warehousing, cold chains, and primary processing units, with a focus on benefiting small and marginal farmers.
5. **Inclusive Access to Resources:** Schemes like PM-KISAN offer direct income transfers that reduce farmers' vulnerability and enable investment in productivity-enhancing inputs. Alongside these measures, land reforms, digitization of land records, and policies promoting joint land ownership are essential for strengthening tenure security, particularly for women and tenant farmers, thereby improving their access to institutional support and agricultural benefits.
6. **Market Access and Price Support:** Policies such as the Minimum Support Price (MSP) and platforms like e-NAM help protect farmers from exploitation by intermediaries and ensure fair returns for their produce. Additionally, agri-export promotion and incentives for agro-processing create opportunities for farmers to access new markets and value chains, integrating them into both national and global supply networks for enhanced income prospects.
7. **Environmental and Climate Resilience:** Institutional mechanisms such as the National Adaptation Fund for

Climate Change (NAFCC) and the Soil Health Card Scheme enhance resilience by promoting efficient use of natural resources and maintaining long-term ecological balance. The growing emphasis on agroecological models like Zero Budget Natural Farming (ZBNF) further reflects a strategic shift towards low-input, high-resilience farming systems that support sustainability and climate adaptability.

Sustainable agriculture and inclusive rural growth cannot be achieved through isolated interventions. A convergent approach, involving research institutions, financial agencies, farmer collectives, and responsive policies, is essential. The synergy between institutional innovation and people-centric policies can transform Indian agriculture into a more resilient, equitable, and sustainable sector, capable of ensuring food security and rural prosperity in the face of rising climatic and economic uncertainties.

Policy Recommendations to Strengthen Agricultural Scheme Delivery for Sustainable and Inclusive Rural Development

Effective implementation of agricultural development schemes is vital for achieving sustainable agriculture and inclusive rural growth in India. Despite numerous initiatives, gaps in outreach, efficiency, and impact persist. Strengthening policy design and delivery mechanisms through decentralization, technology integration, and beneficiary inclusion can significantly improve outcomes and ensure that support reaches the most vulnerable farming communities.

1. **Strengthen Last-Mile Delivery Mechanisms:** Deploying agricultural extension workers and village-level facilitators can significantly help farmers access and utilize various scheme benefits. Additionally, establishing farmer help centres at gram panchayat levels for awareness creation, registration assistance, and grievance redressal would improve outreach, streamline processes, and ensure timely support for beneficiaries.
2. **Improve Scheme Targeting and Inclusion:** Leveraging land record digitization, remote sensing, and AI-based farmer profiling can help accurately identify eligible beneficiaries for agricultural schemes. To promote inclusivity, flexible documentation norms and community-based certification should be implemented to ensure that tenant farmers, sharecroppers, women farmers, and tribal communities are not excluded from accessing these benefits.
3. **Simplify Access and Processes:** A unified digital portal integrating Aadhaar, land records, and bank accounts can streamline the registration and tracking of all agricultural schemes, ensuring greater efficiency and transparency. Complementing this, mobile app-based services in regional languages should be promoted to provide farmers with easy access to scheme information and application processes, enhancing inclusivity and outreach.
4. **Enhance Financial Support and Timely Disbursement:** Linking benefit payments to seasonal crop calendars can ensure timely financial support aligned with farmers' production cycles. Automatic Direct Benefit Transfers (DBT) with real-time alerts to beneficiaries, coupled with streamlined fund release protocols, would further reduce delays and enhance the efficiency of scheme implementation.
5. **Promote Awareness and Capacity Building:** Regular

awareness campaigns, field demonstrations, and farmer training programs conducted through Krishi Vigyan Kendras (KVKs), NGOs, and Farmer Producer Organizations (FPOs) can greatly enhance farmers' understanding and participation in various schemes. Additionally, integrating agricultural scheme literacy into rural education programs and community-based training initiatives would build long-term awareness and capacity among farming communities.

6. **Encourage Decentralized and Participatory Governance:** Empowering Panchayati Raj Institutions (PRIs) and Farmer Producer Organizations (FPOs) to actively participate in scheme planning, implementation, and monitoring can enhance local relevance and accountability. Adopting a bottom-up planning approach that incorporates feedback from farmer collectives ensures that schemes are better aligned with ground realities and farmer needs.
8. **Foster Convergence of Schemes:** Integrating related schemes such as PM-KISAN, the Soil Health Card program, and PMFBY under a cluster-based model can promote holistic farm development. Additionally, fostering convergence with rural employment, irrigation, and nutrition programs can create synergies that multiply the overall impact, enhancing both farm productivity and rural livelihoods.
9. **Strengthen Monitoring and Evaluation (M&E) Systems:** Establishing real-time dashboards and feedback mechanisms can help track the progress of agricultural schemes and enable timely course corrections in implementation. Additionally, conducting independent third-party evaluations will provide objective assessments of scheme effectiveness and help identify key areas for reform and improvement.
10. **Leverage Technology and Innovation:** Utilizing satellite imagery, IoT devices, and AI analytics can enable real-time monitoring of crops, weather patterns, and scheme delivery, ensuring timely interventions and improved efficiency. At the same time, promoting climate-smart technologies, organic farming practices, and water-saving innovations within scheme guidelines can enhance sustainability and resilience in agriculture.
11. **Ensure Environmental and Social Safeguards:** Integrating sustainability indicators into all agricultural support schemes can ensure that development efforts align with long-term environmental goals. Encouraging practices that enhance soil health, promote water conservation, protect biodiversity, and foster community participation particularly involving marginalized groups will strengthen both ecological balance and social inclusivity in agriculture. Improving the outreach and efficiency of agricultural schemes requires a farmer-centric, technology-enabled, and decentralized policy approach. Prioritizing inclusivity, transparency, and coordination across institutions will ensure that development schemes truly empower Indian farmers and contribute to sustainable and equitable rural transformation.

Conclusion

The central government's agricultural schemes have played a vital role in addressing key challenges in the farming sector ranging from income insecurity and production risks to lack of access to markets, finance, and technology. Schemes like PM-KISAN have provided essential income support, while PMFBY has offered a risk safety net against crop failure.

Similarly, initiatives such as the Soil Health Card Scheme, e-NAM, and the Kisan Credit Card have contributed to productivity enhancement, market efficiency, and institutional credit access.

However, despite these interventions, several implementation bottlenecks including limited awareness, infrastructural constraints, poor last-mile delivery, and the exclusion of small, marginal, and tenant farmers continue to affect overall outcomes. Regional disparities in scheme access and the digital divide further constrain the inclusive potential of these programs.

A comprehensive evaluation suggests that while the intent and scope of these schemes are commendable, greater policy coherence, administrative efficiency, and local-level participation are required to maximize their impact. Key areas of improvement include the digitization and integration of services, better coordination among implementing agencies, timely disbursement of benefits, and the inclusion of vulnerable groups, including women and tribal farmers.

To ensure the long-term sustainability and equity of agricultural development in India, it is crucial to shift from a scheme-centric to a systems-based approach where policies are not only reactive but proactive in building climate resilience, encouraging innovation, and empowering farming communities. Only through such a holistic and inclusive strategy can agricultural schemes serve as catalysts for a more prosperous, self-reliant, and food-secure rural India.

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