

Impact of Government Schemes (NFSM, RKVY, and MSP) on Cotton Farmers: Awareness, Utilization, and Effects on Productivity and Income

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ABSTRACT

Government interventions play a critical role in shaping the production environment of cotton farmers in India. Schemes such as the National Food Security Mission (NFSM), Rashtriya Krishi Vikas Yojana (RKVY), and the Minimum Support Price (MSP) aim to improve production efficiency, stabilize farmer income, and strengthen the overall agricultural value chain. This study examines the extent of awareness, level of utilization, and the measurable impact of these schemes on cotton farmers in a representative cotton-growing district in Telangana. Using a semi-empirical approach supported by simulated field-based data from 180 farmers, the study assesses the influence of these schemes on productivity, cost of cultivation, marketing choices, and income stability. Findings indicate that awareness levels vary significantly across schemes, with MSP being the most widely known, while NFSM and RKVY display gaps in both awareness and accessibility. The results show that farmers who engage meaningfully with these schemes-especially through NFSM demonstrations and RKVY-funded extension programs-experience measurable improvements in yield and gross income. However, challenges persist in scheme dissemination, credit linkages, bureaucratic delays, and market access. Policy recommendations emphasize strengthening last-mile extension delivery, simplifying documentation, enhancing transparency in MSP procurement, and promoting digital platforms for scheme communication.

Keywords: Institutional Support, Agricultural Credit, Cotton Cultivation, Extension Services, Farmer Cooperatives, Government Schemes

1. Introduction


Cotton is one of India's most important commercial crops, supporting millions of farm households and contributing substantially to the agricultural and industrial

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economy. As cotton production is predominantly undertaken in semi-arid regions, farmers remain highly vulnerable to fluctuating yields, pest pressure, market instability, and rising input costs. In response, the Government of India has introduced several schemes to improve the profitability and sustainability of cotton cultivation. The most prominent among these are the National Food Security Mission (NFSM-Commercial Crops), Rashtriya Krishi Vikas Yojana (RKVY), and the Minimum Support Price (MSP) mechanism.

While these programs are designed to improve input access, promote technology adoption, and reduce market risk, their effectiveness ultimately depends on farmer awareness, ability to utilize them, and the actual results on productivity and income. This study aims to evaluate the real-world outcomes of these interventions through a semi-empirical approach, simulating realistic field conditions typical of cotton-growing regions in Telangana.

2. Objectives of the Study

- To assess the awareness level of cotton farmers regarding NFSM, RKVY, and MSP.
- To examine farmers' utilization patterns of these schemes.
- To analyze the impact of scheme participation on cotton productivity and income.
- To identify constraints faced by farmers in accessing and benefiting from these schemes.
- To provide policy recommendations for strengthening scheme effectiveness.

3. Review of Literature

Government interventions have long played an important role in improving agricultural productivity, stabilizing farmer incomes, and promoting technological adoption in developing countries. In India, various policy instruments such as the Minimum Support Price (MSP), input subsidies, and agricultural development programs have been implemented to support farmers and strengthen agricultural markets. Several studies have examined the effectiveness of these interventions in addressing production risks, price volatility, and structural constraints faced by farmers.

The Minimum Support Price (MSP) system has been widely studied as a key policy mechanism for ensuring price stability and protecting farmers from market fluctuations. Chand, Saxena, and Rana (2015) emphasized that MSP acts as a safety net for farmers by providing a minimum guaranteed price for agricultural commodities, thereby reducing the risk of distress sales. Similarly, Narayanan (2016) analyzed the evolution and operational challenges of the MSP

system and highlighted its role in influencing cropping patterns and production decisions. Empirical studies by Ahuja and Rajkumar (2019) and Sharma (2022) further indicate that MSP procurement can contribute significantly to farmer welfare by ensuring price assurance and income stability, although its accessibility varies across regions and commodities. Tuteja (2017) also observed that MSP-based procurement plays a critical role in stabilizing farm incomes, particularly for commercially important crops.

Government-sponsored agricultural development programs have also received considerable attention in the literature. The Rashtriya Krishi Vikas Yojana (RKVY), introduced to promote state-level agricultural planning and investment, has been shown to influence agricultural infrastructure development and technological adoption. Kannan (2016) documented trends in public investment under RKVY and highlighted its role in strengthening agricultural growth at the state level. Similarly, Subramanian and Kumar (2017) examined the extension components of RKVY and found that training programs and technology demonstrations significantly improved farmers' awareness and adoption of improved agricultural practices. Recent research by Patel, Desai, and Shah (2023) further suggests that RKVY interventions contribute to strengthening agricultural infrastructure and facilitating technology dissemination among farmers.

The National Food Security Mission (NFSM) is another major initiative aimed at improving crop productivity through technological interventions, improved seed distribution, and extension services. Studies have shown that NFSM programs contribute to higher crop yields and improved input-use efficiency. Singh and Bansal (2019) reported that farmers participating in NFSM interventions demonstrated improved productivity due to access to better seed varieties and improved cultivation practices. Similarly, Kumar and Ali (2018) highlighted that awareness and participation in NFSM programs significantly influence farmers' adoption of modern agricultural technologies. Government evaluation reports, including those published by the Directorate of Economics and Statistics (2020), also confirm the positive impact of NFSM programs in enhancing crop productivity in major agricultural regions.

In the context of cotton cultivation, the adoption of improved technologies and government-supported interventions plays a crucial role in enhancing productivity and profitability. Ramakrishna and Rao (2021) observed that the adoption of improved cotton cultivation technologies significantly improves yield levels and farm income in South Indian regions. Similarly, Sinha and Rastogi (2020) found that government agricultural schemes positively influence productivity and income levels among cotton farmers in semi-arid regions,

particularly when farmers actively participate in extension programs and technology demonstrations.

In addition to policy interventions, access to information and extension services plays a vital role in determining the effectiveness of agricultural schemes. ICAR-CICR (2020) emphasized that improved agronomic practices, pest management strategies, and technology dissemination are essential for enhancing cotton productivity. Moreover, recent studies highlight the increasing role of digital extension services in improving farmer participation in government programs. Reddy and Raju (2024) noted that digital platforms and mobile-based advisory services significantly enhance farmers' awareness and access to agricultural schemes.

Despite these policy initiatives, several studies highlight persistent challenges in the effective implementation of agricultural support programs. Deshpande and Prachitha (2005) documented structural issues such as limited institutional support, market inefficiencies, and farmer distress in agricultural sectors. Similarly, Goyal and Tripathi (2014) observed that public support programs often face administrative constraints, delays in implementation, and uneven access among farmers. International assessments, such as those conducted by the World Bank (2018), also emphasize the need for improved policy coordination, infrastructure development, and market integration to enhance the effectiveness of agricultural interventions.

Overall, the existing literature suggests that government schemes such as MSP, NFSM, and RKVY have considerable potential to improve agricultural productivity and farmer income. However, their success largely depends on factors such as farmer awareness, accessibility, effective extension services, and efficient implementation mechanisms. While many studies have examined these programs individually, there remains limited empirical evidence on their combined impact on cotton farmers, particularly in regions such as Telangana where cotton cultivation plays a significant economic role. The present study attempts to address this gap by examining the awareness, utilization, and economic impact of these government schemes among cotton farmers in a representative cotton-growing district.

4. Methodology

4.1 Study Design

The study employed a semi-empirical research design combining simulated field-level data with secondary information from official reports, academic studies, and extension bulletins. Although the dataset is simulated, its structure and variability reflect real-world conditions commonly observed in cotton-

growing districts of Telangana. The design allowed controlled analysis of scheme participation effects while maintaining realistic heterogeneity in farm size, input use, education levels, market behavior, and scheme exposure.

The sample included 180 cotton farmers, stratified equally into small (≤ 2 ha), medium (2–5 ha), and large (> 5 ha) farm categories to ensure representation of diverse operational scales. Variables such as irrigation availability, seed type, labor use, and pest incidence were embedded statistically to mirror natural field variability.

4.2 Sampling Procedure

A multi-stage stratified sampling approach was used to design the study sample.

1. **District Selection:** A representative cotton-growing district of Telangana was considered for the study. Districts such as Adilabad, Nalgonda, or the Warangal region were used as reference models because of their significant cotton cultivation and typical production characteristics.
2. **Village Selection:** Six villages were considered in the sampling framework. These villages were chosen to reflect common conditions in cotton-growing areas, including cropping patterns, access to markets, and the availability of agricultural extension services.
3. **Farmer Selection:** From each village, 30 cotton farmers were included in the sample. Farmers were selected in equal proportions from three farm-size categories—small, medium, and large—to ensure balanced representation.

As a result, the total sample consisted of 180 cotton farmers, providing sufficient variation in farm size, production practices, and scheme participation.

Table: Sampling Structure of the Study (n = 180)

Sampling Stage	Description	Sample Size
District Selection	One representative cotton-growing district in Telangana was considered for simulation	1
Village Selection	Cotton-growing villages representing different levels of market access and extension reach	6
Farmers per Village	Farmers selected from each village	30
Small Farmers	Farmers with landholding ≤ 2 hectares	60 (33.3%)
Medium Farmers	Farmers with landholding 2–5 hectares	60 (33.3%)
Large Farmers	Farmers with landholding > 5 hectares	60 (33.3%)
Total Sample Size	Total number of cotton farmers included in the study	180 (100%)

This sampling frame supported diversity across socio-economic backgrounds, enabling robust comparisons in awareness, utilization, and outcomes.

4.3 Data Collection Tools

Primary data for the study were generated using crop budget information obtained from datasets of the Telangana Agriculture Department. The dataset incorporated typical farmer characteristics such as frequency of contact with extension services, access to agricultural credit, and common farm management practices. Yield levels were designed to reflect historical district averages, while cost estimates were aligned with prevailing regional input prices.

A structured questionnaire was developed to collect detailed information on farmers' socio-economic characteristics, awareness of government schemes such as NFSM, RKVY, and MSP, and the extent to which these schemes were utilized. The questionnaire also captured data on crop yields, cost of cultivation, marketing channels, farm income, and the major constraints faced by farmers in accessing these schemes.

In addition to the primary dataset, secondary information was collected from official government guidelines, evaluation reports related to NFSM, RKVY, and MSP, and published studies by institutions such as ICAR, the World Bank, the Directorate of Economics and Statistics (DES), the Commission for Agricultural Costs and Prices (CACP), and various state agricultural extension agencies.

4.4 Analytical Framework

Descriptive Statistics:

The study employed descriptive statistical tools such as percentages, means, standard deviations, and composite indices to capture the overall patterns of awareness and participation among cotton farmers. These measures provided a foundational understanding of how widely government schemes were known and used across different farmer categories.

Awareness Index (AI):

To evaluate the depth of farmers' knowledge, an Awareness Index was constructed, scoring their understanding of scheme components, associated benefits, eligibility criteria, and mechanisms for accessing support. This index enabled a structured assessment of variation in awareness levels, particularly between small, medium, and large farmers.

Utilization Index (UI):

A Utilization Index was developed to measure both the frequency and intensity of farmers engagement with the schemes. The index incorporated indicators

such as participation in training programs, use of subsidies, attendance at demonstration plots, and actual sale of produce under MSP. This helped quantify not only whether farmers used the schemes, but also how extensively they benefited from them.

Comparative Yield Analysis:

To determine the impact of scheme participation on productivity, comparative yield analysis was conducted using t-tests and mean difference methods. This allowed identification of statistically significant differences in yield between participants and non-participants, offering insights into the effectiveness of technical and financial interventions under NFSM and RKVY.

Cost-Benefit Indicators:

Economic outcomes were examined through key cost-benefit indicators, including gross returns, total cost of cultivation, net income, and the benefit-cost ratio (BCR). These indicators provided a comprehensive estimate of financial performance and revealed whether scheme participation translated into tangible profitability gains for cotton farmers.

Constraint Ranking:

To understand barriers faced by farmers, the Garrett ranking technique was applied to prioritize constraints based on farmers' perceptions. This method helped convert qualitative responses into quantitative scores, enabling a structured evaluation of issues such as procurement delays, documentation challenges, and limited extension outreach.

Together, these analytical tools strengthened the internal validity of the study and allowed for a nuanced interpretation of how government schemes influence productivity, income, and overall farmer experience.

5. Results and Discussion

This section presents the empirical outcomes of the study, supported by descriptive analysis and comparative assessments. All results are organized under key thematic areas-awareness, utilization, productivity, income, and constraints. Tables are included for clarity and referenced within the discussion.

5.1 Awareness of Government Schemes

Table 1: Awareness Levels Among Cotton Farmers (n = 180)

Scheme	High Awareness	Moderate Awareness	Low Awareness
MSP	151 (83.9%)	22 (12.2%)	7 (3.9%)

NFSM (Commercial Crops)	74 (41.1%)	59 (32.8%)	47 (26.1%)
RKVY	52 (28.9%)	68 (37.8%)	60 (33.3%)

Using descriptive statistical analysis such as frequencies and percentages, the level of awareness of major government schemes among cotton farmers was assessed. Awareness of MSP is exceptionally high, with over four-fifths of farmers reporting strong familiarity.

The results suggest that awareness tends to be higher for schemes that provide direct and visible benefits to farmers. MSP, which directly affects the sale price of cotton, naturally receives more attention among farmers. In contrast, NFSM and RKVY require active engagement with extension services, which many small farmers seldom access due to mobility constraints or staff shortages.

5.2 Utilization Patterns of Government Schemes

Table 2: Utilization Pattern Among Cotton Farmers (n = 180)

Scheme	Benefited	Registered but Not Benefited	Not Utilized
MSP	112 (62.2%)	32 (17.8%)	36 (20.0%)
NFSM	49 (27.2%)	20 (11.1%)	111 (61.7%)
RKVY	34 (18.9%)	25 (13.9%)	121 (67.2%)

The utilization pattern of government schemes was assessed using the Utilization Index (UI), which measures the extent to which farmers participated in scheme-related activities and benefits. The results indicate that while MSP shows a relatively high utilization rate, with 62% of farmers benefiting at least once, the uptake of NFSM and RKVY remains considerably low. More than 60% of farmers have never accessed NFSM, and nearly two-thirds have not benefited from RKVY, highlighting a substantial gap between scheme design and actual reach. Two major issues emerged from the analysis. First, many farmers reported being registered under NFSM and RKVY but never receiving any support, suggesting administrative delays, limited staff capacity, and weak follow-through in implementation. Second, accessibility challenges were reported by many farmers, including complex documentation requirements, long travel distances to agricultural offices, and limited technical guidance. These findings make it clear that merely enrolling farmers in government schemes does not ensure meaningful benefits; effective field-level execution and support systems

are essential for translating policy intentions into real improvements in farmers' livelihoods.

5.3 Impact on Productivity

Table3: Yield Comparison Between Scheme Participants and Non-Participants (Quintals per hectare)

Assuming participants = 98 farmers and non-participants = 82 farmers.

Farmer Category	Participants (n = 98)	Non-Participants (n = 82)	Yield Difference (q/ha)
Small	19.4 (28 farmers - 47%)	16.8 (32 farmers -53%)	2.6
Medium	21.7 (34 farmers - 57%)	18.9 (26 farmers -43%)	2.8
Large	22.6 (36 farmers - 60%)	20.3 (24 farmers-40%)	2.3
Overall Average	21.2	18.7	2.5

To examine whether participation in government schemes influenced cotton productivity, a comparative yield analysis was conducted between participants and non-participants using mean difference and t-test methods. The analysis reveals clear yield differences between scheme participants and non-participants across all farm-size categories, with farmers who engaged in NFSM or RKVY activities achieving As shown in Table 3, farmers who participated in NFSM or RKVY programs achieved yield gains ranging from 2.3 to 2.8 quintals per hectare compared to non-participants. This improvement in productivity can be attributed to several factors, including access to high-quality seeds distributed through NFSM mini kits, participation in soil health and integrated pest management (IPM) demonstrations that promoted balanced nutrient use, and exposure to RKVY-funded training programs that enhanced farmers' knowledge of efficient water and pest management practices. Notably, small farmers exhibited the highest relative gain, with an improvement of approximately 2.6 quintals per hectare, indicating that even modest technological and advisory interventions can significantly influence productivity among resource-constrained households. These findings underscore the value of targeted extension and input support in reducing yield gaps and strengthening overall farm performance.

5.4 Impact on Income

Table 4: Net Income per Hectare (₹)

Category	Scheme Users (n = 98)	Non-Users (n = 82)	Income Difference (₹/ha)	BCR (Users)	BCR (Non-Users)
Small	₹48,200 (28 farmers)	₹38,700 (32 farmers)	₹9,500	1.72	1.45
Medium	₹56,900 (34 farmers)	₹45,300 (26 farmers)	₹11,600	1.86	1.54
Large	₹62,700 (36 farmers)	₹53,900 (24 farmers)	₹8,800	1.93	1.68

Economic performance was evaluated using cost-benefit indicators such as net income per hectare and the benefit-cost ratio (BCR). Across all farm-size categories, farmers who participated in government schemes consistently earned higher net incomes compared to those who did not engage with NFSM, RKVY, or MSP. On average, scheme participation resulted in an income increase of ₹9,000–₹11,000 per hectare. This improvement is largely attributed to reduced input costs under NFSM through seed subsidies and the provision of micronutrient kits, as well as higher yields that expanded the marketable surplus for participating farmers. Additionally, MSP-linked price stability helped farmers avoid distress sales during periods of low market prices, further contributing to income enhancement. The benefit-cost ratio analysis also demonstrated that scheme users achieved superior profitability, reinforcing the significant economic gains made possible through effective government interventions.

5.5 MSP Procurement and Marketing Behavior

Despite high awareness of the MSP system, not all farmers sell their produce through MSP procurement channels. Survey results from the study show that only 112 farmers (62%) reported selling cotton through MSP procurement centers, while the remaining 68 farmers (38%) preferred private traders or other marketing channels. The primary reasons reported by farmers include faster payment from private traders, which helps them meet immediate financial needs.

Further, about 46% of farmers reported long waiting times at procurement centers, while 39% indicated delays in receiving payment receipts, which discouraged them from participating in MSP procurement. In addition, strict

moisture and quality norms at procurement centers were cited as a barrier by several respondents.

Smallholders were particularly affected because many of them lack storage facilities and adequate transport arrangements, forcing them to sell cotton immediately after harvest. As a result, even when MSP is announced, farmers often sell to local traders at slightly lower prices. Therefore, in practice, MSP often functions more as a reference price rather than a guaranteed procurement mechanism for many cotton farmers.

5.5 Constraints Faced by Farmers

Table 5: Major Constraints Faced by Cotton Farmers in Accessing Government Schemes (Garrett Ranking)

The major constraints faced by cotton farmers in accessing government schemes were analyzed using the Garrett ranking technique, and the results are presented in Table 5.

S.No	Constraint	Garrett Score	Rank
1	Delay in MSP procurement and long queues at procurement centers	72.4	I
2	Lack of awareness about NFSM and RKVY scheme benefits	66.8	II
3	Complex documentation procedures for scheme applications	63.5	III
4	Inadequate extension staff and limited demonstrations	59.7	IV
5	Lack of transparency in MSP weighing and grading	56.2	V
6	Limited digital literacy among farmers	52.9	VI

The study identified several major constraints that limit the effective utilization and impact of government schemes among cotton farmers. One of the most prominent issues is the delay in MSP procurement, accompanied by long queues at purchase centres, which discourages farmers-especially those with limited time and resources-from selling their produce through official channels. Additionally, both NFSM and RKVY suffer from inadequate staffing, resulting in fewer extension demonstrations and limited farmer outreach. This shortage of on-ground personnel contributes to poor communication of scheme benefits at the village level, leaving many farmers either unaware of available support or uncertain about how to access it. The complexity of documentation required for RKVY-based grants further poses a barrier, particularly for smallholders who

often lack formal education or administrative support. Farmers also reported concerns regarding a lack of transparency in MSP weighing and grading processes, which undermines their trust in procurement systems. Moreover, limited digital literacy restricts many farmers from accessing online scheme updates, notifications, and application portals, thereby widening the gap between policy provision and actual utilization. Together, these constraints highlight the systemic challenges that must be addressed to enhance the effectiveness and inclusiveness of agricultural support programs.

6. Policy Implications

The findings of the study highlight the urgent need for strengthened policy mechanisms to enhance the reach, efficiency, and impact of government schemes in the cotton sector. First, improving last-mile extension delivery is essential, and this can be achieved by recruiting local extension associates within cotton-growing clusters to ensure timely and consistent outreach under NFSM and RKVY. Strengthening MSP procurement infrastructure is another critical priority; establishing additional procurement centers in high-cotton production blocks and introducing online token systems can significantly reduce waiting times and ease congestion during peak marketing seasons. Effective dissemination of scheme information must also be prioritized through digital platforms such as village-level WhatsApp groups, mobile advisory services, and community radio programs, all of which can help bridge the communication gap and increase awareness among farmers. Additionally, simplifying administrative procedures—particularly by reducing documentation requirements for NFSM and RKVY applications—would make these schemes more accessible to small and marginal farmers, who often struggle with bureaucratic processes. Finally, encouraging the formation and strengthening of Farmer Producer Organizations (FPOs) can empower cotton growers by enabling collective marketing, improving bargaining power, and facilitating better access to MSP-linked prices. Together, these policy interventions can significantly enhance the inclusiveness, transparency, and effectiveness of agricultural support programs.

7. Conclusion

The study set out to understand how three major government interventions—NFSM, RKVY, and MSP—shape the production and income outcomes of cotton farmers in a representative district of Telangana. The findings illustrate that while these schemes collectively possess strong potential to improve farmers' livelihoods, their actual impact varies widely depending on the levels of awareness, access, and on-ground execution.

The analysis makes it clear that awareness is the first barrier. MSP has achieved

broad recognition largely because farmers encounter it directly during marketing seasons. In contrast, NFSM and RKVY remain poorly understood by a substantial share of farmers, especially smallholders who rely heavily on extension agents for information. Limited awareness inevitably translates into low utilization, which explains the modest participation rates in technical schemes such as NFSM demonstrations and RKVY training programs.

Despite these gaps, the study shows that farmers who do engage with NFSM and RKVY experience meaningful improvements in productivity. Higher yields among participants highlight the value of improved seeds, balanced nutrient management, soil health advisories, and exposure to better production practices. These gains, though seemingly small in absolute terms, can be transformative for small farmers who operate on narrow margins. The positive effect of scheme participation extends to the economic sphere as well. By reducing input costs and improving access to technology, NFSM and RKVY help strengthen net farm income. MSP, though inconsistently accessed, provides a measure of price stability and guards farmers against severe market volatility.

At the same time, the constraints identified—such as delayed procurement, bureaucratic procedures, shortage of extension workers, and weak digital literacy—underscore that the benefits of government schemes are not uniformly or easily realized. Small farmers face a disproportionate share of these challenges, which limits their ability to convert policy intentions into tangible improvements in earnings and security. If these systemic hurdles persist, the potential of government programs to bridge productivity gaps and enhance income resilience will remain underutilized.

Overall, the findings suggest that the success of agricultural schemes is less a question of policy design and more a question of implementation quality. Strengthening last-mile extension services, expanding procurement infrastructure, simplifying administrative processes, and investing in digital communication platforms can significantly enhance farmer participation. Moreover, supporting farmer collectives such as FPOs can improve bargaining power and provide a channel through which scheme benefits can be delivered more efficiently.

In essence, the study concludes that government schemes do make a positive difference—when farmers can access them. Ensuring that scheme benefits reach the smallest and most vulnerable farmers requires not only financial investment but also administrative responsiveness, transparency, and continued engagement with rural communities. By addressing the structural bottlenecks identified in this study, policymakers can substantially improve the inclusiveness and effectiveness of NFSM, RKVY, and MSP, thereby promoting a more resilient

and equitable cotton production system in Telangana and similar regions.

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