

Original Article

Impact of PM-KISAN Assistance on Farmers' Agricultural Resilience Strategies under Climate Risk: A Study of Drought- and Excess-Rainfall-Affected Areas

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**Abstract**

Climate variability has become a major threat to Indian agriculture, especially for small and marginal farmers who depend on seasonal rainfall, limited savings, and timely input use. PM-KISAN provides annual income support of INR 6,000 in three instalments of INR 2,000 to eligible landholding farmer families. Although the scheme is not formally designed as a climate-adaptation programme, its flexible cash-transfer structure can influence farmers' ability to purchase drought-tolerant seeds, diversify crops, maintain soil health, adopt small water-saving measures, and restart cultivation after crop loss. This article examines whether PM-KISAN assistance contributes to agricultural resilience in drought- and excess-rainfall-affected areas. The study focuses on three major concerns: use of PM-KISAN money for climate-risk management, differences between beneficiaries and non-beneficiaries in reinvestment capacity and credit dependence after crop loss, and the adequacy of INR 6,000 annual assistance during climate shocks. Based on recent official data, policy reports, and a proposed field-study design, the article argues that PM-KISAN works as a useful liquidity-support mechanism but is insufficient as a standalone climate-resilience instrument. Its effectiveness can be enhanced through convergence with crop insurance, micro-irrigation, climate-resilient seeds, soil-health services, local advisory systems, and timely disaster-response support.

Keywords: PM-KISAN, agricultural resilience, climate risk, drought, excess rainfall, direct benefit transfer, crop diversification, micro-irrigation, soil health, climate adaptation, farm credit.

Introduction

Indian agriculture is increasingly exposed to climate-related risks such as delayed rainfall, prolonged dry spells, excess rainfall, floods, heat stress, and soil moisture instability. These risks are particularly severe for small and marginal farmers because their production decisions depend on timely sowing, affordable inputs, limited savings, and short-term credit. A climate shock does not merely reduce current output; it also affects the next production cycle by weakening the farmer's ability to buy seeds, fertilizers, pesticides, irrigation services, livestock feed, and labour. PM-KISAN is one of India's largest direct farmer-support programmes. Under the scheme, each eligible landholding farmer family receives INR 6,000 per year in three equal instalments through direct benefit transfer. On June 20, 2026, the twenty-third instalment transferred more than INR 18,880 crore to about 9.44 crore farmers, including more than 2.18 crore women farmers. Since the launch of the scheme in 2019, total disbursement has crossed INR 4.46 lakh crore, and the Union Budget 2026–27 allocated INR 60,000 crore for the scheme [1]. The climate-risk context gives PM-KISAN importance beyond its conventional income-support role. Since the transfer is not tied to a particular input, the farmer can use it according to immediate need. In a normal season, the amount may support seeds, fertilizers, pesticides, irrigation, household expenses, or debt repayment. In a climate-stressed season, it may be used for drought-tolerant seeds, short-duration varieties, crop diversification, emergency re-sowing, soil amendments, or minor irrigation-related expenses. The amount is modest compared with the cost of serious climate damage.

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A flood or drought can destroy a standing crop, increase re-sowing expenditure, raise debt dependence, and reduce household consumption. Therefore, the central issue is not whether PM-KISAN alone can protect farmers from climate shocks, but whether it improves their ability to respond, reinvest, and avoid distress borrowing.

Review of Related Literature

Existing studies on PM-KISAN mainly examine income support, agricultural input use, credit constraints, and farm productivity. A government-reported assessment states that over 92 percent of beneficiary farmers used PM-KISAN assistance for essential agricultural inputs such as seeds, fertilizers, and pesticides. It also reports that about 85 percent of beneficiary farmers experienced an increase in agricultural income and a reduction in reliance on informal credit during crop failures or medical emergencies [2]. Another official background note refers to a study in Uttar Pradesh, where most PM-KISAN beneficiaries were small and marginal farmers with holdings below two hectares. The study found that beneficiary farmers spent mainly on ploughing, fertilizers, and seeds. It also reported that paddy yield was 3.08 percent higher and wheat yield was 1.93 percent higher on beneficiary farms than on non-beneficiary farms, while beneficiary households recorded a 9.85 percent increase in farm income [1]. The literature on climate-resilient agriculture shows that rainfall-dependent farming remains highly vulnerable. Rainfed agriculture accounts for nearly 60 percent of India's net sown area and contributes about 40 percent of total food production. The National Mission for Sustainable Agriculture emphasizes water-use efficiency, soil health, integrated farming systems, and climate-resilient farming as key responses to climate variability [3].

Recent climate evidence also supports the urgency of this subject. The Climate India 2025 assessment reported that India experienced extreme weather events on 99 percent of the days during the first nine months of 2025. These events affected 9.47 million hectares of cropped land, damaged houses, killed livestock, and caused severe livelihood losses [4]. Such figures show that climate risk is no longer an occasional production problem; it is a recurring structural risk for agriculture. Policy literature further indicates that climate resilience requires multiple instruments. Micro-irrigation under the Per Drop More Crop component has brought 110.92 lakh hectares under micro-irrigation since inception. Small and marginal farmers receive 55 percent financial assistance for micro-irrigation systems, while other farmers receive 45 percent assistance

[5]. Similarly, the Indian Council of Agricultural Research released 2,900 crop varieties during 2014–2024, of which 2,661 are tolerant to one or more biotic or abiotic stresses [6]. The gap in the existing literature is that PM-KISAN is usually studied as an income-support scheme, while its possible role in climate-risk management remains less explored. This article addresses that gap by linking cash support, climate adaptation, post-loss reinvestment, and credit dependence.

Objectives of the Study

1. To examine whether farmers use PM-KISAN assistance for climate-risk management practices such as drought-tolerant seeds, crop diversification, micro-irrigation, and soil-health inputs.
2. To compare PM-KISAN beneficiaries and non-beneficiaries in terms of reinvestment capacity and credit dependence after crop loss caused by drought or excess rainfall.
3. To identify whether annual assistance of INR 6,000 is adequate during climate shocks or whether it mainly functions as short-term relief.

Hypotheses

H1: PM-KISAN beneficiaries are more likely than non-beneficiaries to allocate part of their seasonal farm expenditure to climate-risk management practices such as drought-tolerant seeds, crop diversification, micro-irrigation, and soil-health inputs.

H2: After crop loss caused by drought or excess rainfall, PM-KISAN beneficiaries have higher reinvestment capacity and lower dependence on informal credit than comparable non-beneficiaries.

H3: The annual assistance of INR 6,000 under PM-KISAN provides short-term liquidity during climate shocks but is not adequate to meet the full cost of climate adaptation or post-loss recovery.

Methodology

This article follows a descriptive and analytical research design. It uses recent secondary data from official releases, government policy material, and climate-risk reports. The main variables include PM-KISAN beneficiary status, amount received, timing of receipt, expenditure on climate-resilient seeds, expenditure on crop diversification, micro-irrigation adoption, soil-health input use, crop-loss percentage, re-sowing capacity, formal credit use, informal credit use, and time taken to restart cultivation after crop loss.

Data Analysis

Table 1: Recent Data Relevant to PM-KISAN, Climate Risk, and Agricultural Resilience

Sr. No.	Indicator	Recent figure	Relevance to the study
1.	Annual PM-KISAN assistance per eligible farmer family	INR 6,000 in three instalments	Shows the amount available for seasonal liquidity support.
2.	Twenty-third PM-KISAN instalment	More than INR 18,880 crore released on June 20, 2026	Shows the current scale of farmer support.
3.	Farmers covered in the twenty-third instalment	About 9.44 crore	Indicates wide national coverage.
4.	Women farmers covered in the	More than 2.18 crore	Shows the gender dimension of benefit

	twenty-third instalment		access.
5.	Total PM-KISAN disbursement since launch	More than INR 4.46 lakh crore	Demonstrates the long-term fiscal scale of the scheme.
6.	Budget allocation for 2026–27	INR 60,000 crore	Indicates continuing policy commitment.
7.	Rainfed agriculture share	Nearly 60 percent of net sown area	Shows high exposure of agriculture to rainfall variability.
8.	Rainfed agriculture contribution	About 40 percent of total food production	Shows food-security importance of climate-vulnerable regions.
9.	Cropped area affected by extreme weather in January–September 2025	9.47 million hectares	Shows the scale of recent agricultural climate damage.
10.	Micro-irrigation coverage under Per Drop More Crop	110.92 lakh hectares since inception	Indicates the scale of water-use-efficiency intervention.
11.	Climate-resilient crop varieties released during 2014–2024	2,900 varieties, including 2,661 stress-tolerant varieties	Shows availability of resilience technologies.

The data suggest that PM-KISAN has very large coverage but provides a limited amount per household. INR 2,000 per instalment can help meet small seasonal expenses, but it cannot finance full-scale climate adaptation such as drip irrigation, farm ponds, protected cultivation, large-scale re-sowing, or major soil restoration. Therefore, PM-KISAN should be analysed as a liquidity supplement rather than a complete risk-protection instrument. For the first objective, evidence from impact assessments shows that PM-KISAN funds are often used for productive agricultural inputs. If beneficiaries already use the money for seeds, fertilizers, and pesticides, there is scope to redirect part of the expenditure toward climate-risk management inputs, including drought-tolerant seed, short-duration seed, seed treatment, diversified cropping, organic manure, and soil amendments [2].

In drought-affected areas, PM-KISAN may help farmers purchase short-duration varieties, millets, pulses, or less water-intensive crops. It may also support partial payment for emergency irrigation, sprinkler accessories, or moisture-conservation practices. In excess-rainfall areas, the amount may be used for re-sowing, drainage cleaning, seed replacement, plant-protection measures, or restoration of soil nutrients after leaching. The timing of transfer is critical. If an instalment is received before sowing or immediately after crop loss, it can influence crop choice and reinvestment decisions. If it arrives after the main farm operation is completed, its value as a climate-risk management tool decline. This makes seasonal alignment of payment important for resilience. For the second objective, beneficiaries may have better post-loss reinvestment capacity than non-beneficiaries. Even a small assured transfer can help farmers buy seed after crop failure, pay for re-sowing, or reduce the need for immediate informal borrowing. It may also improve bargaining power with input dealers because the farmer has some cash in hand. However, in severe climate shocks, the transfer may only reduce the size of borrowing rather than eliminate borrowing.

For the third objective, the adequacy of INR 6,000 must be assessed carefully. The amount is meaningful for liquidity but insufficient for full recovery. A drought or flood can destroy crops, damage soil structure, reduce fodder availability, increase household distress, and create debt pressure. In such cases, PM-KISAN may help farmers

restart limited operations, but it cannot replace crop insurance, disaster compensation, low-interest institutional credit, irrigation infrastructure, or local climate advisory systems. Recent monsoon developments further show why liquidity matters. A July 2026 report noted that rainfall weakness in western and southern India could slow sowing of crops such as cotton, soybean, and maize. It also reported that June rainfall was 39.8 percent below average and that crop sowing as of July 5 was 21 percent lower than the previous year [7]. In such situations, farmers need quick decisions on crop choice, re-sowing, seed type, and water use. PM-KISAN can support some of these decisions, but only if the transfer is timely.

Conclusion

The study concludes that PM-KISAN plays an important but limited role in agricultural resilience under climate risk. Its main contribution is liquidity. It gives eligible farmers a predictable cash flow that can support input purchase, reduce short-term credit pressure, and enable limited climate-risk responses. Its flexibility is a major advantage because farmers can decide whether to use the money for seeds, fertilizers, pesticides, irrigation, soil health, re-sowing, or debt repayment. PM-KISAN is not sufficient as a standalone climate-adaptation programme. The annual amount of INR 6,000 is small compared with the cost of crop loss, re-sowing, irrigation investment, soil restoration, and recovery from flood or drought. Its impact depends strongly on the timing of instalments, access to local input markets, irrigation availability, extension services, insurance coverage, and institutional credit. The strongest conclusion is that PM-KISAN should be treated as a base-layer income and liquidity support scheme. It can improve short-term coping capacity, but deeper climate resilience requires convergence with crop insurance, micro-irrigation, climate-resilient seeds, soil-health programmes, local water management, and low-interest credit.

Suggestions

1. PM-KISAN instalments should be aligned more closely with major sowing seasons and climate-risk windows. Transfers before sowing would increase the possibility that farmers use the amount for productive and resilience-oriented inputs.
2. PM-KISAN payment notifications should be linked with local climate advisory messages. Farmers in drought-prone areas may receive advice on short-

duration crops, low-water crops, seed treatment, and moisture conservation. Farmers in excess-rainfall areas may receive advice on drainage, re-sowing, plant protection, and soil restoration.

3. PM-KISAN should be converged with crop insurance. Beneficiaries should receive simple information on insurance enrolment, claim procedures, and coverage against adverse weather events.
4. PM-KISAN beneficiaries should be encouraged to combine their cash transfer with micro-irrigation subsidies. PM-KISAN alone cannot finance micro-irrigation, but it can help cover small contribution costs, repair expenses, or complementary inputs.
5. Village-level seed banks and community nurseries should be strengthened in climate-vulnerable districts. This would help farmers use PM-KISAN money quickly for re-sowing after drought, flood, or pest damage.
6. PM-KISAN beneficiary data should be linked with district-level climate vulnerability maps to identify farmers who may need additional support during officially recognized drought or excess-rainfall events.

Future Recommendations

Future research should conduct primary surveys in drought- and excess-rainfall-affected districts to measure the actual share of PM-KISAN money used for climate-resilience practices. A comparative study between beneficiaries and non-beneficiaries can estimate differences in re-sowing capacity, informal credit dependence, and recovery time after crop loss. Further studies should examine the timing effect of PM-KISAN instalments. If a transfer arrives before sowing, it may influence seed choice and crop diversification. If it arrives after crop damage, it may support recovery and re-sowing. This timing dimension deserves independent analysis.

Future research should also examine women beneficiaries separately. Women farmers may allocate assistance differently, especially toward seed saving, food security, livestock, and low-risk crop choices. Longitudinal studies should track the same farmers across several crop seasons to understand whether PM-KISAN creates only temporary coping support or contributes to gradual adaptive capacity. Policy research should examine whether a climate-linked top-up can be added to PM-KISAN in districts officially affected by drought, flood, or extreme rainfall. Such a top-up could make the scheme more responsive to climate shocks without changing its basic direct-transfer structure.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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