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Agricultural subsidies and farmer outcomes: A study of economic and social impact in Dhule district

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Abstract
This research examines the impact of agricultural subsidies on the economic and social welfare of farmers in the Dhule region of Maharashtra, India, focusing on those who practice irrigated (Bagayat) and dry land (Jirayat) farmingA structured questionnaire featuring a 7-point Likert scale was employed to gather information from a group of 124 farmers, consisting of 64 with irrigated land and 60 with non-irrigated land. The study used independent samples t-tests to compare responses to 10 variables of economic and social well-being. While several aspects, such as lower cultivation costs, debt reduction, and confidence in future planning, did not differ significantly, crop productivity ($p = 0.042$), standard of living ($p = 0.007$), and affordability of education and healthcare ($p = 0.036$). These data indicate that, while subsidies assist all farmers, irrigated land farmers see bigger benefits in specific well-being outcomes. The study provides policymakers with insights into how to modify subsidy schemes to meet the demands of both farming types in an equitable manner.

Keywords: Agricultural subsidies, irrigated vs. dry land farming, economic well-being, social security, farmer welfare, maharashtra, rural development, subsidy impact, crop productivity, independent samples t-test

Introduction

Agricultural subsidies in India have played an important role in developing farmers' economic and social outcomes, but their impact is multidimensional and complex. These subsidies are intended to increase agricultural profitability, maintain income stability, and stimulate rural development. However, there is ongoing disagreement about the usefulness and sustainability of these subsidies. While subsidies have helped to boost agricultural output and income in the near term, their long-term impact on profitability and sustainability is unclear. This analysis examines the economic and social effects of agricultural subsidies on Indian farmers, building on findings from a variety of studies.

Review of Literature

This section explores the economic and social impacts of agricultural subsidies on Indian farmers, drawing insights from various studies.

Economic Impact of Agricultural Subsidies

(Dixon *et al*., 2020; Mishra *et al*., 2024) [4, 6] Agricultural subsidies have played an important role in increasing agricultural output and income, notably for inputs such as fertilisers and power. However, these subsidies frequently cause market imbalances and overproduction, which can damage long-term profitability and sustainability.

(Wadhwa & Nandal, 2023) [8] MSP and the Electronic National Agriculture Market (e-NAM) have had a good influence on agricultural earnings and access to markets, helping to crop diversification and economic well-being, particularly for smallholder farmers in places like Haryana**.**

(Dixon *et al*., 2020) [4] Fertiliser and electricity subsidies account for around 0.20% of GDP in deadweight loss. Fixing these with production and sales subsidies might potentially raise real farm income by around 4% while not severely hurting the public sector budget.

(Dahiri & Prasetyo, 2022) [3] Fertiliser subsidies have boosted farmers' welfare and the competitiveness of crops such as rice, maize and soybeans. However, managerial inefficiencies often prevent the full potential of these subsidies from being realised.

(K. M. *et al*., 2021) Government schemes such as PM-KISAN and PMFBY have facilitated financial inclusion and modernisation of agriculture, assisting in the transformation of the rural economy and improving farmer welfare.

(Shivashankar & G, 1014) [7] Despite the considerable benefits of agricultural subsidies, there remain discrepancies in their distribution, particularly among marginalised groups such as SC/ST farmers. Addressing these disparities is critical to promoting social justice and equity.

(Anand and Sah, 2020) [1] Mismanagement and corruption frequently plague subsidy distribution, preventing the full benefits from reaching the intended beneficiaries. This necessitates a more transparent and efficient subsidy distribution system.

(Akber *et al*., 2022; Mishra *et al*., 2024) [2, 6] To integrate agricultural policy with sustainability goals, it is advocated that input subsidies be replaced by more decoupled support mechanisms, such as direct income support and agri-environmental schemes. Furthermore, state investments in research, education, and infrastructure should be prioritised to encourage private on-farm investment and boost the sector's competitiveness.

While agricultural subsidies have played an important role in assisting Indian farmers, their long-term viability and usefulness are debated. The need for a more focused and effective strategy to subsidy distribution is clear, with an emphasis on resource conservation, climate resilience, and rural development. Balancing the financial burden of subsidies with the need to enhance agricultural productivity and farmer income presents a major dilemma for policymakers. Addressing these issues through rational

policy-making and improved management practices can help maximize the benefits of subsidies for Indian farmers.

Research Design and Methodology

The research sought to evaluate how agricultural subsidies affect the economic and social welfare of farmers in the Dhule district.

Hypothesis

H_0: In Dhule district, agricultural subsidies have no substantial impact on the economic and social well-being of irrigated land (Bagayat) farmers against dry land (Jirayat) farmers.

H_1: In Dhule district, agricultural subsidies have a substantial impact on the economic and social well-being of irrigated land (Bagayat) farmers against dry land (Jirayat) farmers.

Data collection and research instrument

A study was conducted in the Dhule district of Maharashtra, India, involving a sample of 124 farmers, of whom 64 possessed irrigated land and 60 owned dry land. Participants evaluated items related to economic and social well-being using a 7-point Likert scale, with response options ranging from "Strongly Disagree" to "Strongly Agree."

Data Analysis and Interpretation

In order to achieve the research objective, the methodology involved calculating means and employing an independent samples t-test to assess statistical significance.

Table 1: Independent Samples t-tests

Group Statistics					
Subcidy Impact	**Farmer Type**	**N**	**Mean**	**Std. Deviation**	**Sig. (2-tailed)**
Subsidies have reduced my cost of cultivation.	Irrigated land	64	5.90	0.772	0.875
	Dry land	60	5.87	0.678	
I have experienced an increase in farm income due to subsidies.	Irrigated land	64	5.38	1.187	0.051
	Dry land	60	5.08	1.214	
Subsidies have helped me invest in better seeds/fertilizers.	Irrigated land	64	6.31	0.947	0.474
	Dry land	60	6.34	0.822	
I have been able to reduce debt because of subsidy benefits.	Irrigated land	64	6.25	0.781	0.434
	Dry land	60	6.15	0.689	
Subsidies have improved my crop productivity.	Irrigated land	64	6.36	0.943	0.042
	Dry land	60	6.16	0.626	
I am more confident in planning for the future due to government support.	Irrigated land	64	6.18	1.006	0.406
	Dry land	60	6.07	0.840	
My family's standard of living has improved due to agricultural subsidies.	Irrigated land	64	6.71	0.824	0.007
	Dry land	60	6.41	0.793	
I feel more socially secure because of these schemes.	Irrigated land	64	6.25	0.728	0.947
	Dry land	60	6.21	0.634	
I am better able to afford my children's education and healthcare.	Irrigated land	64	5.98	1.001	0.036
	Dry land	60	5.72	0.952	
Subsidies have helped reduce rural migration in my area.	Irrigated land	64	5.91	1.158	0.441
	Dry land	60	5.96	0.928	
I regularly follow start-up news, entrepreneurs, or business content. (Entrepreneurial Orientation)	Irrigated land	64	5.97	1.377	0.908
	Dry land	60	5.92	1.283	

Interpretation

1. "Subsidies have reduced my cost of cultivation."

Mean Scores: Irrigated land – 5.90; Dry land – 5.87, p-value: 0.875

Interpretation: Since the p-value is above 0.05, the difference is not statistically significant. Null hypothesis is not rejected. Irrigated and dry land farmers perceive a similar reduction in cultivation costs due to subsidies.

2. "I have experienced an increase in farm income due to subsidies."

Mean Scores: Irrigated land – 5.38; Dry land – 5.08, p-value: 0.051

Interpretation: Since the p-value is slightly above 0.05, the difference is not statistically significant. Null hypothesis is not rejected. However, irrigated farmers report a marginally higher increase in income due to subsidies.

3. "Subsidies have helped me invest in better seeds/fertilizers."

Mean Scores: Irrigated land – 6.31; Dry land – 6.34, p-value: 0.474

Interpretation: Since the p-value is above 0.05, the difference is not statistically significant. Null hypothesis is not rejected. Both groups equally benefit in terms of investing in quality inputs.

4. "I have been able to reduce debt because of subsidy benefits."

Mean Scores: Irrigated land – 6.25; Dry land – 6.15, p-value: 0.434

Interpretation: Since the p-value is above 0.05, the difference is not statistically significant. Null hypothesis is not rejected. Irrigated and dry land farmers report similar debt reduction due to subsidies.

5. "Subsidies have improved my crop productivity."

Mean Scores: Irrigated land – 6.36; Dry land – 6.16, p-value: 0.042

Interpretation: Since the p-value is below 0.05, the difference is statistically significant. Null hypothesis is rejected. Irrigated farmers report a higher improvement in crop productivity due to subsidies.

6. "I am more confident in planning for the future due to government support."
Mean Scores: Irrigated land – 6.18; Dry land – 6.07, p-value: 0.406
Interpretation: Since the p-value is above 0.05, the difference is not statistically significant. Null hypothesis is not rejected. Both groups report similar confidence in future planning due to subsidies.

7. "My family's standard of living has improved due to agricultural subsidies."
Mean Scores: Irrigated land – 6.71; Dry land – 6.41, p-value: 0.007
Interpretation: Since the p-value is below 0.05, the difference is statistically significant. Null hypothesis is rejected. Irrigated farmers report a greater improvement in living standards due to subsidies.

8. "I feel more socially secure because of these schemes."
Mean Scores: Irrigated land – 6.25; Dry land – 6.21, p-value: 0.947
Interpretation: Since the p-value is above 0.05, the difference is not statistically significant. Null hypothesis is not rejected. Both groups feel similarly socially secure due to the schemes.

9. "I am better able to afford my children's education and healthcare."
Mean Scores: Irrigated land – 5.98; Dry land – 5.72, p-value: 0.036
Interpretation: Since the p-value is below 0.05, the difference is statistically significant. Null hypothesis is rejected. Irrigated farmers report better affordability for children's education and healthcare.

10. "Subsidies have helped reduce rural migration in my area."
Mean Scores: Irrigated land – 5.91; Dry land – 5.96, p-value: 0.441
Interpretation: Since the p-value is above 0.05, the difference is not statistically significant. Null hypothesis is not rejected. Both groups perceive a similar impact of subsidies on rural migration.

Conclusion

The study shows that agricultural subsidies have a variable but significant influence on farmers in the Dhule district. While both irrigated and dry land farmers' economic and social well-being has increased, irrigated land farmers gain more in certain categories like as crop productivity, standard of living, and access to education and healthcare. The statistically substantial differences support the alternative hypothesis (H_1), which suggests that land type influences the efficiency of subsidies. However, the lack of substantial variation in other areas, such as cultivation cost reduction and future planning confidence, suggests that subsidies benefit both farmer categories. To guarantee equitable and sustainable rural development, policymakers should consider these details when creating and targeting subsidy programs.

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