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Impact of Agricultural Initiatives Under Digital India Programme on Farmers with Special

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Abstract
Agriculture forms the backbone of the Indian economy, supporting about half of the population and contributing approximately 18.3% to the GDP. Despite significant challenges posed by climate change, digital technologies, urbanization, and economic factors, the Indian government has launched several initiatives under the Digital India Programme to strengthen agricultural productivity and support farmers. This study examines the impact of three major initiatives: SATHI, PM-KISAN, and Kisan Sarathi, using primary data from 200 farmers in Tenkasi District and secondary data from journals, websites, and magazines. The findings reveal substantial improvements in the availability and quality of seeds, financial stability, adoption of new farming practices, and overall agricultural productivity. The initiatives have significantly enhanced farmers' standard of living by providing timely information, improving access to quality inputs, and reducing financial losses. The study concludes with recommendations for strengthening awareness and training, improving digital infrastructure, expanding advisory services, and promoting sustainable farming practices to ensure the long-term success and broader reach of these initiatives.

Keywords: Agricultural Initiatives, Digital India, SATHI, PM-KISAN, Kisan Sarathi

INTRODUCTION

Agriculture is the backbone of Indian economy, about half of India's population relies on agriculture and other industries for their livelihood (D. Kumar & Phougat, 2021). Agriculture constitutes a vital component of the Indian economy, with approximately 18.3% of the total GDP. However, agriculture industry has changed over years due to climate changes, digital technologies, urbanization, economic factors, etc. To overcome these fluctuations Indian government has launched numerous initiatives for supporting farmers.

The government is taking highly proactive measures to boost farming activities with the help of the Digital India Programme. The country's farming techniques have been totally transformed by agricultural initiatives under the Digital India program, which aims to use digital technologies to boost agricultural productivity, ensure farmers' welfare, and promote sustainable practices.

The Seed Authentication, Traceability & Holistic Inventory (SATHI) project, is designed to assist the farmers in ensuring the timely and accurate distribution of high quality seeds and eliminating the potential

spurious seed from the ecosystem (Informatics, 2024). SATHI is a national portal envisioned and created by the Ministry of Agriculture and Farmers' Welfare, Govt. of India, in partnership with the National Informatics Centre (NIC) with the vision, to build a digital ecosystem to effectively monitor the seed production and distribution chain and provide complete traceability of the seeds from the point of origin till they reach the farmer (SATHI - Digital India, MeitY, Government of India, 2024).

Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), a central government funded scheme launched in December 2018 to facilitate farmers in purchasing various agricultural inputs. The scheme started from February 2019. It provides to each eligible farmer's family Rs 6000 per annum in three instalments of Rs 2000 each. Initially, farmers with less than 2 hectares of land were eligible; subsequently, from June 2019 it was extended to all farmers i.e. 140 million farmers. Money is transferred directly to beneficiary's bank account (P. Kumar & Babu, 2018).

The objective of m4agri is to empower the farmers by providing the right information at the right time by implementing a mobile-based agro-advisory system. This is a mobile pull and push-based system where agriculture-related information and advisory services can be pulled/ pushed by the farmers using their mobile phones (Agro Based Advisory – m4Agri - MeitY, Government of India, n.d.). This initiative is available in two states of North-Eastern Region i.e. Mizoram and Tripura with a special focus on livestock and fish farmers.

Indian Council of Agricultural Research (ICAR) developed a digital platform for agricultural extension system named as Kisan Sarathi System of Agri information Resources Auto-transmission and Technology Hub Interface. This has been developed to support this emerging need of multi ways and multilingual communication among various agricultural stakeholders. The ultimate goal of this project is to implement an intelligent online platform for supporting agriculture at local niche with national perspective (Rai, 2023). This is intended to provide a seamless, multimedia, multi-ways connectivity to the farmers with the latest agricultural technologies, knowledge base and the pool of large number of subject matter experts (Kisan Sarathi).

Review of Literature

Vărzaru, (2025) The study explores the transformative impact of digital technology on agriculture, focusing on its effects on agricultural output and labour productivity, as measured by the digital economy and society index. The study found that digital technologies have a significant impact on agricultural output and labour productivity, indicating that the integration of digital innovation is crucial for enhancing the performance of the agricultural sector.

Padmaja et al., (2024) This study examines the utilization of the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) plan money by beneficiary farmers in the Marathwada region of Maharashtra across two financial years. The analysis focused on allocating cash for agricultural and non-agricultural activities in three instalments every year. The results showed a shift in money consumption patterns between the two years. The findings indicate that while the PM-KISAN scheme aims to support agricultural productivity, the funds are increasingly used for household needs.

Shahil Kumar et al., (2024) The study delves about SATHI scheme. The objectives, modules, stakeholders' eco-system, seed inventory module workflow, outcomes of seed inventory modules and its advantages were explored in the paper.

Ghosh et al., (2024) The study investigates the performance of the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) scheme, which provides Rs.6000 annually to small and marginal farmers in India, focusing

on its impact on improving the living conditions of these farmers. The study found that beneficiaries of the PM-KISAN scheme had a higher average Livelihood Index compared to non-beneficiaries. This indicates a significant improvement in the livelihood conditions of small and marginal farmers who received cash transfers through the scheme.

Kumar, (2024) The study highlights the significance of the Pradhan Mantri Kisan Samman Nidhi Yojana (PM-KISAN Yojana) in promoting self-reliance among farmers and its potential to enhance agricultural productivity, indicating a positive impact on the economic status of beneficiary farmers in Ranchi district.

Rai, (2023) The study explores various digital initiatives for agriculture. The researcher found that adoption of digital technologies can help India to increase agricultural productivity, reduce waste, increase agricultural export, increase farmers' income and improve food and nutrition security.

Parashar, (2023) The study investigates about Kisan Sarathi portal, to assist farmers in obtaining the correct information at the right time, delivered in their preferred language. The study found that awareness and utilization of the Kisan Sarathi portal among farmers are relatively low but user of the portal reported that the Kisan Sarathi portal effectively delivers information in a timely manner.

Singh et al., (2020) The research focuses on the implementation of Smart Phone Agro-Advisory Services (AAS) in North East India, particularly targeting farmers in MeghalayaThe model demonstrated a positive impact on the farmers' ability to manage natural resources in a climate-smart manner, which is crucial given the unique challenges faced by the region, such as fragility and cultural diversity.

Kumari et al., (2018) The study brought out the awareness of farmers on Digital India Program in Southern Zone of Andhra Pradesh. They found that certain gaps in the implementation of the program due to factors relevant to farmers. Especially, the level of education, the level of awareness of technology of the farmers are few factors which hamper the affectivity of Digital India and they also suggested easy access to the tutorials in local languages can be coordinated to bring impact on the services, vernacular e-mail services will help the Indian farmers to connect and communicate better.

Objectives

- To analyze the impact of agricultural initiatives under Digital India Programme among farmers.
- To offer valuable suggestions based on the findings on the study

Data and Methodology

The study consists of both primary and secondary data. The primary data were collected from respondents of Tenkasi District. The secondary data were collected from journals, websites and magazines. A purposive sampling technique was used for data analysis around the study area. The study has been conducted in Tenkasi district covering 200 farmers. Statistical tools such as percentage analysis and paired t test were used for analysis.

Analysis and Discussion

Table1: Demographic Profile

Variables	Categories	Respondents	
		Frequency	Per cent
Gender	Male	123	61.5
	Female	77	38.5
Age	Below 30	26	13

	30-40 41-50 Above 50	46 87 41	23 43.5 20.5
Marital Status	Married Unmarried	178 22	89 11
Educational Qualification	Illiterate Middle School High School Diploma Degree	42 71 56 20 11	21 35.5 28 10 5.5
Monthly Income	Below 20,000 20,000 – 40,000 Above 40,000	42 143 15	21 71.5 7.5

The study revealed that 61.5 per cent of farmers are male and 43.5 per cent of farmers are between the age group of 41 – 50. Most of the farmers are married with 89 per cent. Majority of farmers with 35.5 per cent have middle school as educational qualification. 71.5 per cent of farmers monthly income are Rs 20,000 – Rs. 40,000.

Table 2: Impact of Agricultural Initiatives

S. No	Variables		Mean	Std. Deviation	Std. Error Mean	t	Sig. (2 tailed)
1	Identification of quality seeds	Before	1.250	1.733	0.123	10.202	0.000
		After	1.630	2.072	0.147	11.124	0.000
2	Seed information with quality certificate	Before	-0.490	1.785	0.126	-3.882	0.000
		After	2.380	1.172	0.083	28.730	0.000
3	Getting sample seeds for testing	Before	0.740	2.617	0.185	4.000	0.000
		After	1.650	1.859	0.131	12.554	0.000
4	Availability of seeds during critical planting seasons	Before	-0.670	1.765	0.125	-5.367	0.000
		After	2.815	1.268	0.090	31.386	0.000
5	Seeds resulted in better crop yields	Before	0.600	0.737	0.052	11.518	0.000
		After	0.980	1.540	0.109	9.000	0.000
6	Reduced the financial losses due to quality of seeds	Before	0.540	0.966	0.068	7.906	0.000
		After	0.905	1.278	0.090	10.012	0.000
7	Registration for seed producing agents and seed processing plants is easy	Before	0.625	2.289	0.162	3.861	0.000
		After	0.800	1.134	0.080	9.975	0.000
8	Financial stability	Before	1.970	0.801	0.057	34.762	0.000
		After	2.895	3.721	0.263	11.004	0.000
9	Better agriculture inputs	Before	2.255	1.116	0.079	28.567	0.000
		After	2.285	2.436	0.172	13.266	0.000

10	Adopting new farming practises	Before	1.030	1.299	0.092	11.213	0.000
		After	2.165	0.912	0.064	33.568	0.000
11	Agricultural productivity	Before	1.630	2.072	0.147	11.124	0.000
		After	2.420	1.086	0.077	31.512	0.000
12	Post-harvest losses	Before	1.250	1.733	0.123	10.202	0.000
		After	2.380	1.172	0.083	28.730	0.000
13	Dependency on money lenders	Before	-0.490	1.785	0.126	-3.882	0.000
		After	0.740	2.617	0.185	4.000	0.000
14	Improved standard of living	Before	1.650	1.859	0.131	12.554	0.000
		After	2.815	1.268	0.090	31.386	0.000
15	Communication with agricultural experts	Before	-0.670	1.765	0.125	-5.367	0.000
		After	0.980	1.540	0.109	9.000	0.000
16	Queries are addressed effectively by the experts	Before	0.600	0.737	0.052	11.518	0.000
		After	0.905	1.278	0.090	10.012	0.000
17	Personalized advisory based on farm	Before	0.540	0.966	0.068	7.906	0.000
		After	0.625	2.289	0.162	3.861	0.000
18	Knowledge on new techniques and technologies	Before	0.800	1.134	0.080	9.975	0.000
		After	2.895	3.721	0.263	11.004	0.000
19	Increase in productivity	Before	1.970	0.801	0.057	34.762	0.000
		After	2.285	2.436	0.172	13.266	0.000
20	Early warnings about weather changes	Before	1.030	1.299	0.092	11.213	0.000
		After	2.255	1.116	0.079	28.567	0.000
21	Reduced crop losses due to timely information	Before	2.165	0.912	0.064	33.568	0.000
		After	2.420	1.086	0.077	31.512	0.000

The table 2 makes it very evident that all of the variables have p value of 0.000 or less than 0.05. It reveals that the null hypothesis is rejected for every variable. Therefore, it indicates that there is effectiveness in implementation of agricultural initiatives.

SATHI has a significant improvement in the ability to identify quality seeds, indicated by the increase in mean scores from 1.250 (before) to 1.630 (after). It has substantial positive shift is noted with the mean score moving from -0.490 (before) to 2.380 (after) in getting detailed information about the seeds with quality certificate. There is enhanced access to seeds for testing with the mean score increases from 0.740 (before) to 1.650 (after). After the scheme there is a notable improvement in availability of seeds during critical planting with the increasing from -0.670 (before) to 2.815 (after). The data shows that use of authenticated seeds resulted in better crop yields, with mean scores rising from 0.600 (before) to 0.980 (after). There's a significant reduction in financial losses after THE use of quality seeds, with the mean scores increasing from 0.540 (before) to 0.905 (after). The scheme has improved the process for registration for seed producing agents and seed processing plants with mean scores increasing from 0.625 (before) to 0.800 (after).

PM-KISAN has marked improvement in financial stability, with mean scores increasing from 1.970 (before) to 2.895 (after). The mean scores show improvement in purchasing better agricultural inputs from 2.255 (before) to 2.285 (after). There's a substantial increase in the adoption of new farming practices,

with mean scores rising from 1.030 (before) to 2.165 (after). The mean scores show an improvement in agricultural productivity from 1.630 (before) to 2.420 (after). There's a significant reduction in post-harvest losses, with mean scores increasing from 1.250 (before) to 2.380 (after). The mean scores improve from -0.490 (before) to 0.740 (after), indicating reduced dependency on money lenders. The standard of living of farmers gas been changed with mean scores increasing from 1.650 (before) to 2.815 (after).
Kisan Sarathi shows significant improvement for farmers in communicating with agricultural experts, with mean scores increasing from -0.670 (before) to 0.980 (after). Farmers queries are addressed effectively by the experts with mean scores rising from 0.600 (before) to 0.905 (after). The mean scores show improvement from 0.540 (before) to 0.625 (after) indicating the scheme helped the farmers in getting personalized advisory based on their farm with mean score. There's a substantial increase in knowledge on new techniques and technologies, with mean scores rising from 0.800 (before) to 2.895 (after). The scheme helped in increasing the productivity with the mean scores of 1.970 (before) to 2.285 (after). There is improvement in receiving early warnings about the weather with mean scores of 1.030 (before) to 2.255 (after). The data shows that the scheme has significantly reduced crop losses by providing timely information to farmers with the mean scores of 2.165 (before) to 2.420 (after).

Conclusion and Suggestions

The agricultural initiatives have substantially benefited farmers by providing timely information, improving access to quality inputs, and enhancing financial stability and productivity. These improvements have collectively contributed to better crop yields, reduced losses, and an enhanced standard of living for farmers. To further enhance these outcomes, it is recommended to strengthen awareness and training, improve access to quality inputs, enhance digital infrastructure, expand advisory services, monitor and evaluate impacts, encourage financial inclusion, promote sustainable farming practices, and strengthen community engagement. These measures will ensure that the benefits of these initiatives reach a larger number of farmers and lead to long-term improvements in their livelihoods. Findings of the present study that most of the farmers in Tenkasi have significant positive impact of agricultural initiatives under Digital India Programme It can be concluded that the agricultural initiatives SATHI, PM-KISAN, and Kisan Sarathi have significantly improved farming outcomes, financial stability, and overall quality of life for farmers.

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