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PM-KUSUM Scheme in Transforming the Farmers Irrigation Status in Odisha

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Abstract

This study is carried out in Odisha's Keonjhar and Sambalpur districts, to anlayse the spread of PM-KUSUM scheme in Odisha. The Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyan scheme (PM-KUSUM) which is launched in the year 2019, is an ambitious scheme of GoI, its goal is to support the unelectrified farmers with renewable solar energy in place of electricity for irrigating the fields. The districts of Odisha have no grid connection for electricity and many of the farmers in the area still remain unelectrified depending on the Kharif rains for cropping. Else the supply of electricity is poor enough that they are not able to rely on it and hence have to depend on diesel pumps for their irrigation needs. The study tries to bring out the new hope that the farmers can see with the solar pumps *via* PM-KUSUM scheme. The adoption and acceptance level of the scheme with the farmers is measured by perception analysis of the farmers.

Keywords: OLIC, OREDA, PM-KUSUM, Solar pump

Introduction

Government of India has launched the Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyan scheme (PM-KUSUM) in 2019, to solarize the irrigation scenario of famers and help them to be independent in their requirements of electricity or fuel to irrigate their fields. Thus, the scheme of solar irrigation directly promotes use of renewable energy source such as Solar, which is the future energy sector in the upcoming days. It can be said that the solar irrigation scheme is the ambitious program of the government being implemented at central level by the Ministry of New and Renewable Energy of Indian Government. The scheme mainly aims for enhancing the farmers income by de-dieselization of the farm sector, under this scheme central government subsidy up to 30% or 50% of the total cost is given to the states which in turn can be given to farmers for the installation of standalone solar pumps and also for existing grid connected agriculture pumps where solarization can be done. Along with this farmer will also be able to setup grid connected solar power plants up to 2 MW under the scheme on their fallow land and sell the electricity generated to local distribution company of electricity (DISCOM) at a tariff which is controlled by the state regulator under the component A (Anonymous, 2025). Thus, the scheme is being implemented by the designated departments of the State Government.

The PM-KUSUM scheme has 3 components and between them, it allows for inter transfer of quantities between component-B and component-C. The main aim of all the three components is to enhance and build up the capacity of solar which accounts to about 34,800 MW by the mid of 2026. It also has the financial support from the central government accounting to Rs. 34,422 crores. The PM-KUSUM scheme has the following 3 main components:

Component A: It deals with establishing of 10,000 MW of ground mounted and decentralized grid connected power plants, or the other renewable energy-based power plants by the group of farmers, FPO's or individual farmers also on their land.

Component B: It aims for standalone solar pumps installation for agriculture purpose at the fields which is estimated to be 14 lakh units.

Component C: It deals with conversion and then Solarization of nearly 35 lakhs agriculture pumps which are grid connected and it also includes solarization at the feeder level as well (Anonymous, 2025).

The farmers are provided with huge subsidy for installation

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of stand-alone solar pumps and for solarization under component B and component C of the scheme. 30% is the share of central government and respective state government provides 30% subsidy thus, only remaining 40% needs to be paid by farmers and in that a farmer can avail 30% as interest free loan thus bearing the cost of only 10% for the down payment. In India, majority of the states are not grid connected for irrigation and hence not suitable for component A.

The graph below represents the number of standalone solar pumps allocated and then installed across the states under the component B of PM-KUSUM scheme.

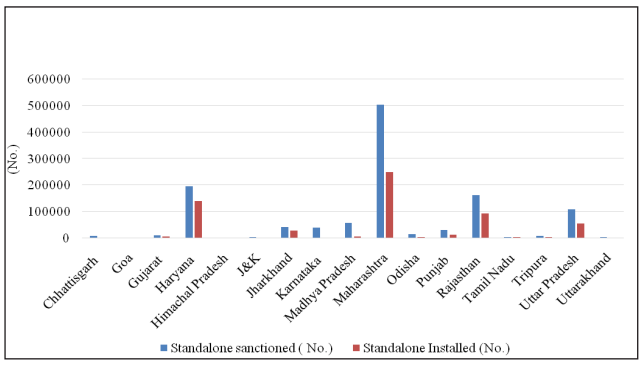

Figure 1: Status of standalone solar powered pumps across states under component B

Standalone Solar Pumps Allocated and Installed under PM-KUSUM Scheme

Similarly in Odisha, where there is no grid connectivity only component B of the PM-KUSUM scheme is taken up with the state authority or the tender agency, which aims for installation of solar pumps to the farmers in the off grid connected areas. The scheme directly helps the farmers to be energy independent and not rely on diesel for irrigation in the unelectrified regions of the state. In Odisha, Odisha renewable energy development agency (OREDA) along with Odisha lift irrigation corporation (OLIC), handles the selection of the beneficiaries, tender taking and installation of the solar panels at the farmer fields. It is carried out either on the basis of cluster approach consisting of 3-5 farmers in the group or at individual farmers' field depending on the area and pump capacity.

A survey was conducted to analyze the spread of solar irrigation and the awareness about the PM-KUSUM scheme among the farmers in the selected district of Odisha. Sambalpur and Keonjhar districts of Odisha were surveyed for this purpose.

Questions were asked to farmers regarding the awareness of the scheme and how well they are able to handle the solar pumps ones being beneficiary of the scheme and other issues. 70 farmers were surveyed in the districts of Sambalpur and Keonjhar together. The tabulation of the farmers' perception is presented below in table 1 and 2 respectively. Since OREDA is the state nodal authority for scheme dispersion in the state along with OLIC, scheme awareness to farmers through the agency was imperative in spread of the solar irrigation.

Table 1: Perception of the farmers regarding the factors affecting the scheme implementation in Sambalpur district (N=35)

Factors	Perception percentage
Awareness about scheme	73% - OREDA as source 27% - NGO
Functionality of the solar pump	83% - Functional 10% - Damaged 7% - Stolen
Increase in cropped area	83% - Yes 17% - No
Difficulty in handling the solar pumps	74% - No handling difficulty
Training received by adopters	100% - No trainings by agency
Satisfaction with the scheme	69% - Satisfied 31% - Not satisfied
Timely monitoring by implementing agency	100% - No monitoring done

Table 2: Perception of the farmers regarding the factors affecting the scheme implementation in Keonjhar district (N=35)

Factors	Perception percentage
Awareness about scheme	06% - OREDA as source 94% - NGO
Functionality of the solar pump	96% - Functional 03% - Damaged 01% - Stolen
Increase in cropped area	100% - Yes
Difficulty in handling the solar pumps	87% - No handling difficulty
Training received by adopters	100% - No trainings by agency
Satisfaction with the scheme	87% - Satisfied 13% - Not satisfied
Timely monitoring by implementing agency	73% - OLIC officials are visiting occasionally at the fields to monitor.

The results of perception analysis for the two districts are contrast, in awareness factor. In Sambalpur district 73% of the farmers source of awareness was OREDA and just 27% opined local contacts as the awareness source. But in Keonjhar district only 6% farmers said directly OREDA as the scheme provider, while 94% of the farmers were introduced to the scheme by the local NGO, who were active in the village with the government. More than 80% farmers said the pumps supplied to them were functional till today, in both districts and theft of solar panels was also a problem in Samabalpur, 7% of the respondent's reported theft. In Keonjhar district 100% of the farmers' opined increased cropped area, similar results were seen in the study of Bihar solar pumps (Shah *et al.*, 2024). While in Sambalpur 17%

farmers denied change in cropped area with solar irrigation. In both the districts more than 70% of the farmers reported no much difficulty in handling the solar pumps in terms of cleaning and maintenance. In Sambalpur district only 69% opined that they are satisfied with the scheme and also that no monitoring is being carried out by agency or any other source on timely basis. In case of Keonjhar 87% of the farmers opined that they are satisfied with the scheme and majority of farmers (73%) also said that OLIC officials are involved in occasional visit at the fields to involve more farmers and also to monitor the solar panels condition. In both the districts the 100% farmers opined that no trainings were conducted by any department or agency to educate the farmers in handling of the solar panels or to deal with the issues related to the scheme. While studies emphasized that adoption of solar irrigation pumps can be effective only with organizational and training support from government or the involved NGO's (Agrawal and Jain, 2019).

Conclusion

Thus, lack of training was the major factor hindering the spread of solar panels and widespread adoption of the PM-KUSUM scheme. Training in terms of creating awareness about the scheme, training to maintain solar panels and skill them in handling with any minor issues arising in solar pump systems or which crops to take up and how much to irrigate, any such awareness was not imparted to the farmers with trainings by any agency involved. Although, many farmers were not able to get the benefits of the scheme due to lack of direct contact with the farmers, farmers in both the district have opined that with solar irrigation the cropped area in the area has increased significantly, which is very welcoming for the farmers as their cropping intensity has also increased more than 140%. The solar pumps have aided the farmers definitely to go for multiple crops in the same piece of land. The proof being that the farmers in Sambalpur district who used to leave their land fallow after Kharif season are able to take up vegetables and other cash crops, like Pineapple, Tomatoes *etc*. Similar outcome was seen in a study in Odisha's Koraput district (Dash *et al.*, 2024). Thus, their income levels have gone up than before and have led to changing the livelihoods at the micro scale. Surely, if the scheme is taken up well across the states it is going to help the many unelectrified farmers with solar energy supply for irrigation. Hence, it ensures transformation of the livelihoods in the long run.

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