Analysis of Constraints Affecting Beneficiaries under Pradhan Mantri Krishi Sinchayee Yojana in Odisha

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ABSTRACT

The study was conducted in 2021 in the Jharsuguda district of Odisha to identify the constraints affecting beneficiaries under the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). The study used a random sampling procedure and collected data through personal interviews with 60 respondents. Garrett’s ranking technique was employed to analyze the constraints as perceived by farmers. The findings revealed that medium and large landholding farmers availed the maximum limit of subsidy, and non-availability of spare parts in the local area, tedious procedures to obtain the benefit of PMKSY, and frequent equipment repairs were the major challenges hindering the performance of beneficiaries under PMKSY. Therefore, key stakeholders must take suitable steps to remove the identified constraints. It is imperative to address these challenges to improve the performance of farmers in Odisha.

INTRODUCTION

Agriculture is not only a crucial contributor to the Indian economy but also shapes the fabric of society, especially in developing countries like India. In the past, subsistence farming was the norm, and farmers produced crops mainly for self-sufficiency in terms of food production. However, this was insufficient to feed the entire nation (Wani et al., 2016). To overcome this challenge, the green revolution began in the 1960s, which involved the adoption of high-yielding varieties, fertilizers, and irrigation. The green revolution led to significant improvements in crop production in India, but much of it was based on over-exploitation of natural resources (Malhotra, 2017). Water, being the “elixir of life,” is the most critical natural resource. Although the planet is covered by 70 per cent water, its usage for human beings is meager (Rasouliazar, 2011). Low and uneven distribution of rainfall, rapid industrialization, and a growing population have contributed to a shortage of water for agriculture (Yadav et al., 2020). The availability of water for irrigation depends on various hydro-meteorological factors, and effective utilization of available water is essential for sustainable agriculture (Kaur & Sharma, 2022). Modern cultivation practices and technological interventions are necessary for improving and supervising water use. The Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), an agriculture irrigation scheme, is the latest catchphrase of the central government. Its aim is to achieve “Per Drop More Crop” by promoting micro-irrigation. The adoption of micro-irrigation, such as drip and sprinkler systems, is expected to save water and improve crop yields. By 2016, the area covered by micro-irrigation in India was 81.46.172 ha, with 9.05.802 ha in Karnataka (Anon, 2016).

Proper utilization of available water for irrigation is crucial, but it remains a major challenge. The lack of water availability has led to the over-extraction of groundwater resources and the development of inefficient irrigation practices (Mukherjee et al., 2022). Therefore, it is essential to adopt modern cultivation practices and technological interventions to improve water-use efficiency in agriculture. Water being a valuable resource for farming, every drop of water available in the distribution system must be used effectively to enhance overall farm production. PMKSY aims to achieve this by providing financial assistance to farmers for the
development of irrigation facilities, including micro-irrigation, which has proven to be an efficient method of water use. The adoption of micro-irrigation systems, such as drip and sprinkler systems, has led to a significant improvement in water-use efficiency and increased crop yields (Sapatapathy et al., 2022). However, there has always been constraints in adoption of modern technologies and many authors like Gupta et al., (2013); Das et al., (2014); Paul et al., (2015); Gireesh et al., (2019); Yadav et al., (2019); Kobba et al., (2020) attempted to analyse the constraints in different setting.

Although, it is also essential to adopt water management strategies such as rainwater harvesting and re-use of treated wastewater in agriculture to ensure sustainable water use, it is essential to look into the constraint part also. In conclusion, the adoption of modern cultivation practices and technological interventions, along with the implementation of water management strategies, is essential for achieving sustainable agriculture and ensuring food security in India.

**METHODOLOGY**

The study was conducted in the Jharsuguda district of Odisha, which was chosen purposively due to its high irrigation area. Four blocks were selected based on the funds allotted and utilized for micro-irrigation under the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), with two having the highest fund utilization i.e., Laikera and Orient and two having the lowest i.e., Badmal and Brajarajnagar. Ten villages were selected randomly from the district, and six beneficiary farmers were selected randomly from each village, making a total sample size of 60. A structured, pretested interview schedule was used to collect relevant information from PMKSY beneficiary farmers. The interview aimed to gather information related to the problems faced by the beneficiaries under PMKSY in Odisha. Constraints were identified, and farmers were asked to rank the problems proposed to them. The Garrett Ranking Technique is a method for assigning numerical scores to the orders of constraints. It is advantageous over simple frequency distribution because it arranges the constraints based on their severity from the respondents' point of view. This means that two or more constraints with the same number of respondents may be given different ranks. To convert ranks into percentages using Garrett's method, the formula is as follows:

\[
\text{Percent position} = 100 \times \frac{(R_j - 0.5)}{N_j}
\]

Where, \( R_j \) = rank given for \( i^{th} \) constraint by \( j^{th} \) individual; \( N_j \) = number of constraints ranked by \( j^{th} \) individual.

Firstly, the percent position of each rank will be converted to scores using the table provided by Garrett & Woodworth (1969). These scores will then be summed for each factor, and the resulting total will be divided by the number of respondents to calculate the mean score for each factor. Next, the mean scores for all constraints will be arranged in descending order to determine their relative importance.

**RESULTS AND DISCUSSION**

Garrett ranking technique was used to analyse various challenges affecting the beneficiaries of Pradhan Mantri Krishi Sinchayee Yojana by the respondents. The respondents were asked to rank the ten factors identified for the purpose of this studies as 1, 2, 3, 4, 5, 6, 7 in order to know their preference in the selection of constraint. The calculated percentage position for the rank 1, 2, 3...7 and their correspondent Garrett table as show in Table 1. For factors, the total score is calculated by multiplying the number of respondents ranking that factor as 1, 2, 3,... and 7 with the respective Garrett table values (Garrett & Woodworth, 1969).

The ranking of constraints associated with Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) presented in Table 2 sheds light on the factors perceived as significant constraints by farmers. The analysis of the table suggests that medium and large land-holding farmers availing the maximum limit of subsidy, followed by non-availability of spare parts, frequent equipment repair, and the tedious procedure to obtain the benefits of PMKSY are the most significant constraints perceived by farmers. These findings are important as they indicate that small farmers are at a disadvantage due to the subsidy allocation process, and there is a need to simplify the application process and ensure that farmers receive timely maintenance and repair services.

In contrast, inadequate publicity and low awareness about PMKSY, and high initial costs for the installation of micro-irrigation systems were perceived as relatively less significant constraints. Although policymakers should increase awareness about PMKSY

**Table 1.** Percentage positions and their corresponding Garrett Table values

<table>
<thead>
<tr>
<th>Rank</th>
<th>Percent position</th>
<th>Table value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100(1-0.5)/7</td>
<td>7.14</td>
</tr>
<tr>
<td>2</td>
<td>100(2-0.5)/7</td>
<td>21.42</td>
</tr>
<tr>
<td>3</td>
<td>100(3-0.5)/7</td>
<td>35.71</td>
</tr>
<tr>
<td>4</td>
<td>100(4-0.5)/7</td>
<td>50.00</td>
</tr>
<tr>
<td>5</td>
<td>100(5-0.5)/7</td>
<td>64.28</td>
</tr>
<tr>
<td>6</td>
<td>100(6-0.5)/7</td>
<td>78.57</td>
</tr>
<tr>
<td>7</td>
<td>100(7-0.5)/7</td>
<td>92.85</td>
</tr>
</tbody>
</table>

**Table 2.** Constraint associated with Pradhan Mantri Krishi Sinchayee Yojana

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Factors</th>
<th>Total score</th>
<th>Average score</th>
<th>Final ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Non-availability of spare parts in local area</td>
<td>3562</td>
<td>59.36</td>
<td>II</td>
</tr>
<tr>
<td>2</td>
<td>Frequent repair of equipment</td>
<td>3446</td>
<td>57.43</td>
<td>IV</td>
</tr>
<tr>
<td>3</td>
<td>Delay in the process and short listing of application</td>
<td>3241</td>
<td>54.01</td>
<td>V</td>
</tr>
<tr>
<td>4</td>
<td>Tedious procedure to obtain benefit of Pradhan Mantri Krishi Sinchayee Yojana</td>
<td>3484</td>
<td>58.06</td>
<td>III</td>
</tr>
<tr>
<td>5</td>
<td>Inadequate publicity and low level of awareness about Pradhan Mantri Krishi Sinchayee Yojana</td>
<td>2471</td>
<td>41.18</td>
<td>VI</td>
</tr>
<tr>
<td>6</td>
<td>Medium and large land holding farmers avail maximum limit of subsidy is 45 per cent.</td>
<td>3568</td>
<td>59.46</td>
<td>I</td>
</tr>
<tr>
<td>7</td>
<td>High initial cost for installation of micro irrigation system</td>
<td>2463</td>
<td>41.05</td>
<td>VII</td>
</tr>
</tbody>
</table>
through effective publicity campaigns, the findings suggest that this constraint should receive less priority compared to others. Furthermore, the fact that the high initial cost of installation was perceived as the least significant constraint is a positive development, indicating that farmers are willing to invest in adopting micro-irrigation systems. However, policymakers should continue to explore ways to reduce the cost of installation to encourage more farmers to adopt this technology. Overall, the study highlights the need to address the constraints associated with PMKSY to ensure that the scheme’s benefits reach all farmers equitably. The findings of the study get the support by Barse et al., (2013) & Bhuriya et al., (2015).

CONCLUSION

The study’s findings indicate that medium and large land-holding farmers availing the maximum limit of subsidy, followed by non-availability of spare parts, frequent equipment repair, and the tedious procedure to obtain the benefits of PMKSY are the most significant constraints perceived by farmers. These constraints are particularly disadvantageous to small farmers, highlighting the need to simplify the application process and ensure that farmers receive timely maintenance and repair services. Overall, the study underscores the importance of addressing the constraints associated with PMKSY to ensure that the scheme’s benefits reach all farmers, particularly small farmers. Policymakers should prioritize addressing the constraints highlighted in this study to promote the sustainable development of agriculture and enhance farm productivity.

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