



ISSN Print: 2618-0723
ISSN Online: 2618-0731
NAAS Rating (2026): 5.04
IJAESD 2026; 9(9): 1142-1147
www.extensionjournal.com
Received: 24-06-2026
Accepted: 01-08-2026
Published: 29-09-2026

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Assesment of the socio-economic characterics of the beneficiaries under the Saur Sujala Yojana in Chhattisgarh

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DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i9o.4327>

ABSTRACT

This study was conducted to evaluate the impact of Saur Sujala Yojan on the beneficiaries of the scheme through primary data collection from 120 beneficiary farmers of two districts, namely Mahasamund and Gariyaband during 2025-26. A well-structured interview scheduled to prepared for the purpose of data collection while maintaining reliability and accuracy of information. Majority of the respondents found middle aged and belonged to family size of 5 to 7 members. Most of them were small farmers having 21 to 30 years of farming experience. A majority proportion belonged to the small farmer category with land holdings of 1 to 2 ha accounting for 40.83 per cent. An overall increase of 24.68 per cent in average annual income was observed while agriculture was the main occupation. The major source of information for the respondents were RAEs. Solar pumps were connected exclusively to tubewells while canals were used as supplementary irrigation sources by a small proportion of respondents. Adoption of solar pumps resulted in a marked improvement in cropping intensity and productivity.

Keywords: Saur Sujala Yojana, Solar pump, Irrigation, Beneficiaries, Socio-economic characteristics

Introduction

Chhattisgarh has considerable water resources due to the presence of major rivers such as the Mahanadi, Indravati and Sheonath and having irrigation potential across 75 per cent of its cultivable land, but only 16 per cent is currently irrigated (Goonj, 2025) [1]. However, a large proportion of the cultivable area still remains dependent on rainfall because the available irrigation facilities are limited. This situation creates difficulties for farmers, particularly small and marginal farmers who have limited resources to invest in irrigation facilities. Unreliable electricity supply and the rising cost of diesel further increase the difficulty of providing timely irrigation to crops.

To counter this situation, Saur Sujala Yojana (SSY) was launched by the Chhattisgarh Renewable Energy Development Agency (CREDA) in November 2016 to provide farmers with an affordable and reliable source of irrigation. The scheme is an important initiative that preceded and complements the PM-KUSUM programme. Under SSY, solar irrigation pumps are provided to farmers with a subsidy of 90–95 per cent. The scheme mainly aims to reduce farmers' dependence on grid electricity and diesel pumps and promote the use of renewable energy in agriculture (Government of Chhattisgarh, 2018) [2]. Solar pumps of 3 HP and 5 HP capacity are provided under the scheme to meet the irrigation needs of farmers. CREDA is responsible for the procurement, installation, monitoring and maintenance of these solar pump systems and also provides necessary technical support to beneficiaries (Rahman *et al.*, 2021) [3]. The availability of subsidized solar pumps helps farmers reduce irrigation costs and provides a dependable source of water for crop production. Thus, the scheme has the potential to improve agricultural productivity as well as the socio-economic condition of beneficiary farmers.

Saur Sujala Yojana provides an important alternative by making solar-powered irrigation accessible to farmers at a highly subsidized cost. The scheme mainly focuses on farmers living in areas where electricity supply is inadequate or unreliable. CREDA manages the implementation of the scheme from installation to maintenance and provides technical assistance when required (Rahman *et al.*, 2021) [3]. Therefore, the introduction of solar irrigation pumps through SSY can help improve irrigation availability, reduce dependence on conventional energy sources and support better agricultural production.

Methodology

The study was carried out during 2025–26 in Chhattisgarh. Mahasamund and Gariyaband districts were purposively selected because they account for a comparatively high concentration of Saur Sujala Yojana beneficiaries. Three blocks Chhura, Mainpur, and Gariyaband in Gariyaband district and Mahasamund, Pithora, and Bagbahara in Mahasamund district were selected. From each selected block, 20 beneficiary farmers

were randomly chosen resulting in a total sample of 120 respondents. Primary data were gathered via personal interviews with a pre-tested structured schedule. Information from the pre-adoption period was collected based on respondents' own records and their recall of the past. The variables were measured using established scales and schedules developed for the study. Data were coded, tabulated and analysed using frequency, percentage, arithmetic mean, and information index for ranking.

Results and discussion

Socio-personal characteristics of beneficiary farmers

The findings presented in the [table 1](#) indicated that the majority of the respondents (36.67%) belonged to the 50–60 years age group followed by 29.17 per cent in the 40–50 years age group and 24.16 per cent above 60 years. Only 10.00 per cent of the respondents were up to 40 years of age aligning with [Srivastava et al. \(2025\) \[4\]](#) for PM-KUSUM adopters. Regarding education the majority of the respondents (41.67%) had middle school education followed by 35.00 per cent with primary school education. About 10.83 per cent had high school education while 6.67 per cent were graduates and above and 5.83 per cent were illiterate corroborating [Markam \(2020\) \[5\]](#) in Jashpur.

In terms of caste the majority of the respondents (57.50%) belonged to the Other Backward Class followed by 32.50 per cent belonging to the Scheduled Tribe. Scheduled Caste and General category respondents accounted for 5.83 and 4.17 per cent respectively ([Pasupalati et al., 2021\) \[6\]](#). Regarding family size the highest proportion of respondents (37.50%) had 8–10 family members followed by 25.83 per cent having 5–7 members and 19.17 per cent having more than 10 members. Only 17.50 per cent had up to four family members. With respect to family type 56.67 per cent of the respondents belonged to joint families while 43.33 per cent belonged to nuclear families ([Raghuwanshi, 2019\) \[7\]](#).

The findings regarding farming experience revealed that the majority of respondents (45.00%) had 21–30 years of farming experience fol-

lowed by 25.83 per cent having more than 30 years of experience. About 15.83 per cent had 16–20 years of farming experience while 8.33 per cent had 11–15 years and only 5.00 per cent had 1–10 years of farming experience. Overall, the findings indicate that the respondents were predominantly middle-aged and experienced farmers with middle-level education and mainly belonged to the Other Backward Class category.

Socio-economic characteristics of beneficiary farmers

[Table 2](#) presented the distribution of respondents according to their landholding size. The data reveal that a majority proportion belonged to the small farmer category with land holdings of 1 to 2 ha accounting for 40.83 per cent. This was followed by the marginal farmer category with land holdings up to 1 ha accounting for 31.67 per cent. Similar findings were reported by [Anant \(2022\) \[8\]](#) who found that small and marginal farmers were the primary beneficiaries. The occupational pattern of the respondents is presented in [Table 3](#). The data revealed that agriculture was the primary occupation of all the respondents accounting for 100.00 per cent. This indicated that crop cultivation formed the principal livelihood activity of the respondents and that their economic activities were largely centred on agriculture. Labour was the next major occupational activity reported by 35.83 per cent of the respondents.

[Table 4](#) presented the distribution of respondents according to their annual family income before and after the adoption of solar pumps. The findings revealed that before adoption the highest proportion of the respondents 46.67 per cent belonged to the annual income group of ₹100001–200000. After the adoption of solar pumps, the highest proportion of the respondents 35.83 per cent belonged to the annual income group of ₹200001–300000. The mean annual family income of the respondents increased from ₹220747.08 before adoption to ₹275240.09 after adoption, representing an overall increase of 24.68 per cent. These findings indicate that the adoption of solar pumps contributed significantly to reducing fuel/electricity costs and improving the economic condition of the beneficiary farmers, consistent with findings by [Anant \(2022\) \[8\]](#) and [Chandrakala et al. \(2023\) \[9\]](#).

Table 1. Socio-personal characteristics of the respondents

Sl. No.	Characteristic	Category	Frequency	Percentage
1.	Age	Up to 40 years	12	10.00
		40–50 years	35	29.17
		50–60 years	44	36.67
		Above 60 years	29	24.16
2.	Education	Illiterate	7	5.83
		Primary school	42	35.00
		Middle school	50	41.67
		High school	13	10.83
		Graduate and above	8	6.67
3.	Caste	Scheduled Caste	7	5.83
		Scheduled Tribe	39	32.50
		Other Backward Class	69	57.50
		General	5	4.17
4.	Family size	Up to 4 members	21	17.50
		5–7 members	31	25.83
		8–10 members	45	37.50
		Above 10 members	23	19.17
5.	Family type	Joint	68	56.67
		Nuclear	52	43.33

(continued on next page)

Sl. No.	Characteristic	Category	Frequency	Percentage
6.	Farming experience	1–10 years	6	5.00
		11–15 years	10	8.34
		16–20 years	19	15.83
		21–30 years	54	45.00
		Above 30 years	31	25.83

Table 2. Distribution of the respondents according to their land holding

Sl. No	Land Holdings	Frequency	Percentage (%)
1.	Marginal (up to 1 ha)	38	31.67
2.	Small (1 to 2 ha)	49	40.83
3.	Semi – Medium (2 to 4 ha)	17	14.17
4.	Medium (4 to 10 ha)	14	11.66
5.	Large (above 10 ha)	2	1.67

Table 3. Distribution of the respondents according to their occupation

Sl. No.	Occupation	Frequency	Percentage (%)
1.	Agriculture	120	100.00
2.	Labour	43	35.83
3.	Service	3	2.50
4.	Animal husbandry	17	14.16
5.	Business	8	6.66

*Based on multiple responses.

Overall increase = 24.68%.

Table 4. Annual family income of respondents

Sl. No	Income group (₹)	Before		Current	
		Frequency	Percentage	Frequency	Percentage
1.	Up to 1,00,000	10	8.33	3	2.50
2.	1,00,001–2,00,000	56	46.67	23	19.17
3.	2,00,001–3,00,000	16	13.33	43	35.83
4.	3,00,001–5,00,000	12	10.00	20	16.67
5.	Above 5,00,000	26	21.67	31	25.83
6.	Mean income (₹)	2,20,747.08		2,75,240.09	

3. Source of irrigation

Table 5 presents the sources of irrigation used by the respondents in the study area. The findings show that 100 per cent of respondents had their solar pumps connected to tube wells, indicating that tube

well was the main source of irrigation. In addition, 55.83 per cent of the respondents used canals, 5.80 per cent used ponds as source of irrigation. Additional other sources such as nala and dam helped meet irrigation requirements for 3.33 percent of respondents.

Table 5. Distribution of respondents according to their Irrigation Sources

Sl. No.	Source of Irrigation	Frequency	Percentage (%)
1	Tubewell	120	100.00
2	Canal	67	55.83
3.	Pond	7	5.80
4.	Others	4	3.33

*Based on multiple responses.

Communicational and psychological characteristics

The findings presented in Table 6 indicate that Rural Agriculture Extension Officers (RAEOs) were the most important source of information among the respondents, with an information index of 79.58,

securing first rank. This was followed by neighbours with an information index of 72.50 and friends with 70.00, securing second and third

ranks, respectively. Progressive farmers occupied fourth rank with an information index of 54.17, while relatives ranked fifth with 42.50. The findings indicated that respondents primarily depended on extension personnel and interpersonal sources for obtaining agricultural information. The findings are consistent with earlier findings by Limje's (2024) [10].

In contrast the internet was less frequently used, with information index of 15.41, securing seventh rank. A majority of respondents never

used the internet obtaining information. The higher dependence on RAEOs may be attributed to their direct contact with farmers and their role in providing reliable and practical agricultural information at the village level. Overall, the findings suggested that interpersonal and extension-based sources played a more important role than digital sources in providing information to the respondents.

Table 6. Sources of agricultural information used by respondents ($n = 120$)

Sl. No.	Sources of information	Regular use F (%)	Often use F (%)	Never use F (%)	I.I (%)	Rank
1	Neighbors	72 (60.00%)	30 (25.00%)	18 (15.00%)	72.50	II
2	Friends	59 (49.17%)	50 (41.66%)	11 (9.17%)	70.00	III
3	Relatives	20 (16.67%)	62 (51.66%)	38 (31.67%)	42.50	V
4	Progressive farmer	25 (20.83%)	80 (66.67%)	15 (12.5%)	54.17	IV
5	RAEOs	77 (64.17%)	37 (30.83%)	6 (5.00%)	79.58	I
6	Internet	10 (8.33%)	17 (14.17%)	93 (77.50%)	15.41	VII
7.	Others	15 (12.5%)	08 (6.67%)	97 (80.83%)	15.83	VI

*I.I. = Information Index

Fig. 1 presented the distribution of respondents according to their level of economic motivation. The findings reveal that the majority of the respondents 57 per cent belonged to the high level of economic motivation category. The findings indicate that most respondents had a high level of economic motivation towards improving their farming

through the adoption of solar pumps. Fig. 2 revealed findings reveal that the majority of the respondents 63 per cent had a high level of attitude towards solar pumps. This was followed by 34 per cent of the respondents who had a medium level of attitude.

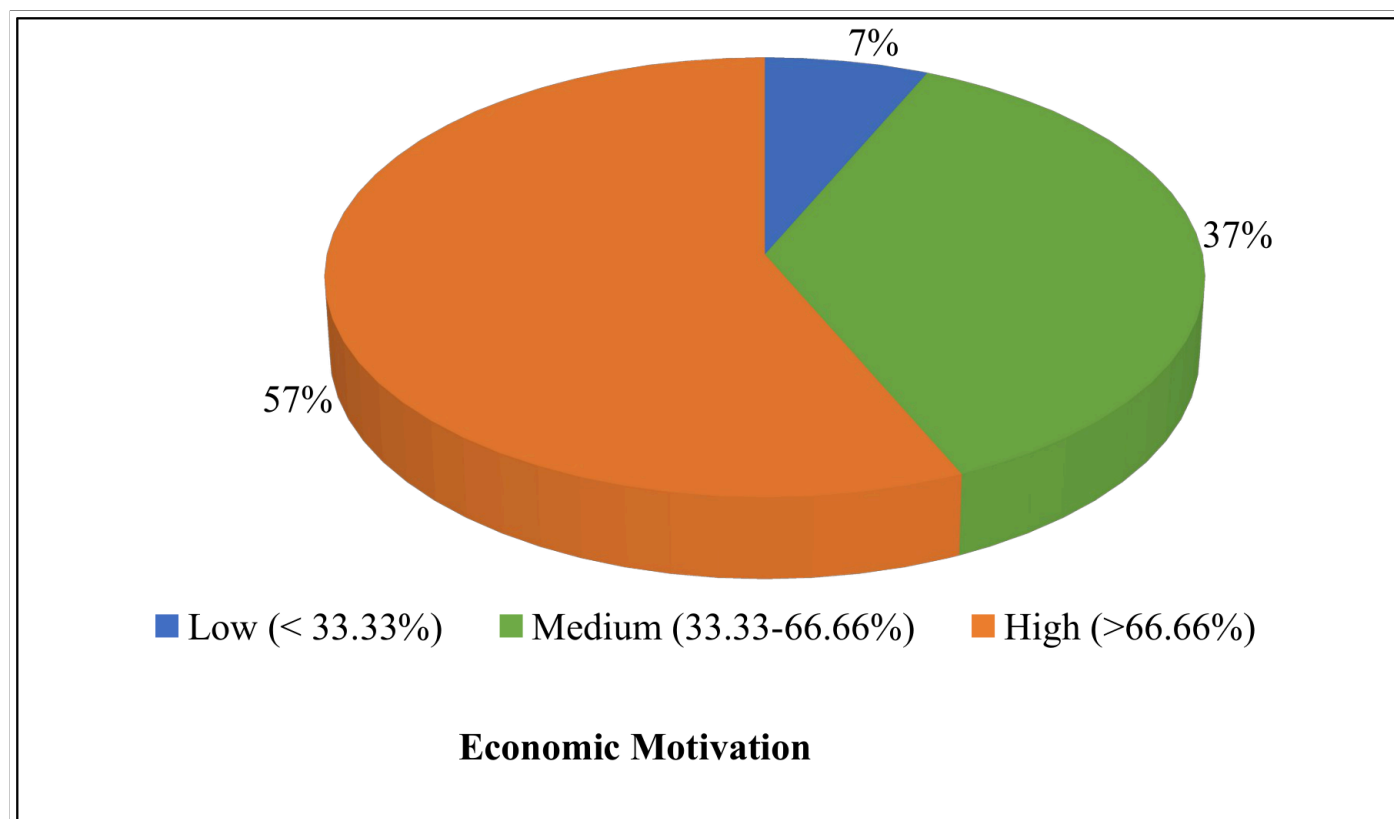


Figure 1. Distribution of respondents according to overall economic motivation towards solar pump

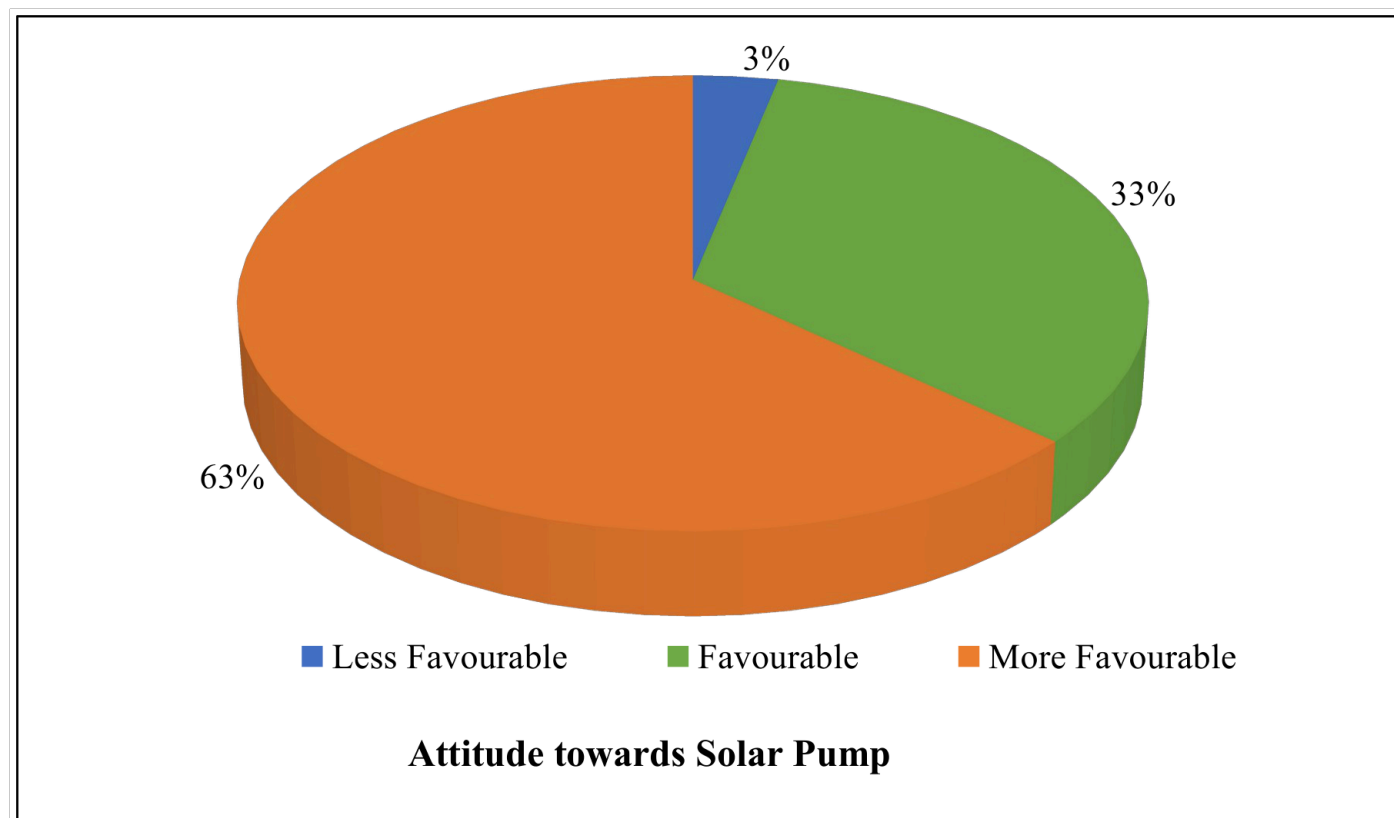


Figure 2. Distribution of respondents according to their attitude towards solar pumps.

Conclusion

The present study concluded that the Saur Sujala Yojana has played an important role in improving irrigation facilities among beneficiary farmers of Mahasamund and Gariyaband districts of Chhattisgarh. The beneficiaries were mainly experienced farmers and agriculture remained their principal occupation. The scheme has proven highly effective in Chhattisgarh, successfully reaching marginal and small farmers with strong inclusivity across OBC and ST communities. The scheme has provided farmers with access to solar-powered irrigation facilities and has helped strengthen their capacity to manage irrigation requirements. The availability of solar pumps has been particularly useful for small and resource-constrained farmers by providing an alternative source of energy for agricultural water pumping.

The study further indicated that the adoption of solar pumps had a favourable influence on the economic condition of the beneficiary farmers. The availability of solar-powered irrigation supported better utilisation of agricultural land and facilitated timely irrigation of crops. Tube wells were the major source of irrigation and the solar pumps were mainly connected to these existing sources. The use of solar energy for irrigation has reduced dependence on conventional energy sources and provided farmers with a more sustainable and economical means of pumping water. Thus, the scheme has contributed not only to improving irrigation access but also to strengthening the overall agricultural livelihood of the beneficiaries.

Rural Agriculture Extension Officers were an important source of information for the beneficiaries and played a significant role in providing guidance related to agricultural practices and the use of solar pumps. Overall, the Saur Sujala Yojana can be considered an important initiative for promoting sustainable irrigation and supporting the economic well-being of farmers in Chhattisgarh. Further strengthening of technical guidance, maintenance services, awareness programmes and extension support would help farmers make more effi-

cient and sustainable use of solar irrigation facilities and maximise the long-term benefits of the scheme.

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How to cite this article: Pradhan S, Pandey P, Sahu R, Sahu P. Assesment of the socio-economic characteristics of the beneficiaries under the Saur Sujala Yojana in Chhattisgarh. *International Journal of Agriculture Extension and Social Development*. 2026;9(9):1142-1147. doi: <https://www.doi.org/10.33545/26180723.2026.v9.i9o.4327>