Original Research Article

Factors Influencing the knowledge level ofFarmers aboutSolar Pumps in Jodhpur District of Rajasthan

ABSTRACT

The research investigation was carried out in Rajasthan's Jodhpur district. In the Jodhpur district of Rajasthan, there are a total of seven tehsils. Osian and Balesar were chosen as the two tehsils with the most solar pumps installed. On the basis of who would benefit from solar pumps the most, ten villages from each chosen tehsil were ~~chosen~~selected. Twenty villages were chosen because they had the most solar pumps, and one hundred twenty-five (125) respondents were chosen from them. Age, caste, education level, size of land holding, family type, social participation, annual family income, occupation, extension contact, and mass utilization were identified as the significant variables that may have influenced the level of knowledge of farmers about solar pumps in the research that examined the social economic status of the respondents. This study revealed that although farmers' awareness of solar pumps was positively and strongly correlated with age, educational attainment, social engagement, occupation, extension contact, and media use. Family type, annual income, and size of land holding show positive and significant relationships with farmers' solar pumps knowledge levels, while caste indicates a negative and non-significant association.

Keywords: Solar pumps, Adoption, Independent variables, Mass media, Social contact, Panelsand Land holding

Introduction

Production of energy is a crucial component for agriculture. All forms of energy, including those that can be used thermally or photovoltaically, are derived from solar energy. Direct use of solar energy is possible for space heating, home lighting for electricity production, hot water heating for domestic use, solar cooking, and other industrial and commercial applications. Solar pumping robust fusion is used in rural development, technology and ecological preservation viable technology is employed for raising living standards, farmers' income, and improving the living conditions of women by lowering labour intensity and eradicating poverty.

The Jawaharlal Nehru National Solar Mission was introduced by the Indian government's prime minister on January 11, 2010. Due to the highest number of sunny days (325) and best solar insolation (6-7 kWh/m2/day), Rajasthan offers one of the most alluring locations for using solar energy for various purposes, especially irrigation. The Government of Rajasthan erected 14 solar pumps on an experimental basis in 2008–2009 in order to harness the enormous amount of solar energy. In 2011–12, the state created an integrated solar water pump scheme by fusing many initiatives from the federal and state governments (Singh et al. 2017).The Ministry of New and Renewable Energy (MNPE) estimates that Rajasthan has a potential for 142 GW of solar-generated electricity. 4,637 MW of solar capacity has been operational in the state as of December 2019. In India, Rajasthan has the highest levels of sun radiation.

The state's solar radiation system has a potential of up to 6-7 kwh/sq m, and there are more than 325 bright days each year, which allows for solar pump systems to continuously feed irrigation for 6–8 hours per day (Anonymous 2014). Rajasthan is one of India's most solar-developed states with a photovoltaic capacity of 2289 MW (Anonymous 2019). Pradhan the Mantri Kisan UrjaSuraksha (PM-KUSUM) UtthanMahabhiyan The government of India launched Yojana to increase the income of farmers and provide sources of irrigation for agricultural sector.Under the KUSUM Yojana, any farmer, group of farmers, panchayat, or cooperative may seek to receive advantages from solar pumps. Farmers receive a 60% government subsidy, 30% of the total cost is covered by a loan from the government, and the remaining 10% is covered by the recipient. The Rajasthani government will deploy 415 solar pumps by 2020. Jodhpur is ranked 20th in the state out of 33 districts (Anonymous, 2017).

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Methodology

The study was carried out in Rajasthan's Jodhpur district. In the Jodhpur district of Rajasthan, there are a total of seven tehsils. Of these, Osian and Balesar were chosen since they had the most solar pumps installed. On the basis of who would benefit from solar pumps the most, ten villages from each chosen tehsil were chosen. Twenty villages with the greatest number of solar pumps were chosen, and 125 beneficiaries from those villages were chosen for the research study (Anonymous 2019). With the aid of an interview schedule, the investigator used the personal interview approach to gather data and information.

Following data tabulation, several statistical measures, including percent, mean, mean percent scores, standard deviation, ranking, and correlation, wereutilized to draw specific conclusions.

Results

Relationship between selected independents variables and knowledge level of farmers about solar pumps

With the aid of the "correlation coefficient (r)," the relationship between the knowledge level of farmers and the independent variables chosen, including age, caste, education level, size of land holding, family type, social participation, annual income of farmers, occupation, extension contact, mass media, and their knowledge level of respondents, was examined. The results are shown in Table 1.

Table:1 Relationship between selected independents variables and knowledge level of farmers about solar pumps

n = 125

S. No.	Independent variables	Correlation coefficient	0.05%	0.01%
1.	Age	0.230	*	-
2.	Caste	-0.008	-	-
3.	Educational level	0.391	*	**
4.	Size of land holding	0.065	-	-
5.	Family type	0.031	-	-
6.	Social participation	0.270	*	**
7.	Annual income of family	0.191	-	-

8.	Occupation	0.220	*	**
9.	Extension contacts	0.269	*	**
10.	Mass media utilization	0.352	*	**

**= significant at 0.01% level, *= significant at 0.05% level, NS = non-significant (-)

The value of the coefficient of correlation shown in table 1 clearly demonstrates that the knowledge level of farmers about solar pumps was directly positively and highly significantly related at 0.05% and at a level of significance of 0.01 with size of education level, social participation, occupation, extension contact, and mass media usage and age. The value of the coefficient correlation shown in table 1 clearly demonstrates that there is no significant relationship between farmers' knowledge of solar pumps and caste, size of land holding, family type, or yearly family income at 0.05 and 0.01%, respectively.

Discussion

With the aid of "correlation coefficients," the relationship between respondents' knowledge levels about solar pumps and independent variables such as age, education level, family type, social participation, occupation, extension contact, and mass media use was examined.

The value of the coefficient of correlation shown in table 1 clearly demonstrates that farmers' knowledge of solar pumps was positively and substantially connected to age, education level, social involvement, occupation, extension contact, and media use at a level of significance of 0.05%. The ~~C~~conclusion is that ~~:~~ f~~F~~armers' understanding of solar pumps may be influenced by their education level, social engagement, interaction with extension agents, and use of the media. Utilization of the media, educational attainment, and social engagement of farmers have all had an impact on public knowledge of solar pumps.

The study was carried out in the Karnataka district of Udupi between 2016 and 2017. In this study, we examined the connection between an independent variable and the farmers' degree of knowledge. Three factors—education, achievement drive, and risk orientation—showed positive and significant relationships at the 1% level of probability out of the total 13 independent variables we chose for the study. Six variables, including annual income, extension

contact, extension engagement, and media participation, however, revealed a positive and significant relationship with knowledge level at a 5% level of probability. Family type and land ownership, the other two variables, did not significantly correlate with knowledge level. (Finding Navignkumar et al., 2019). There was a positive and extremely significant link between education, annual income, social participation, and extended participation and knowledge level (Finding Deshmukh 2015). Extension contacts gave more thorough information about new technologies, and media exposure raised farmers' awareness of those technologies and their familiarity with solar pumps.

Due to the fact that caste, family, size of land holding, and family annual income of respondents did not directly affect knowledge level about solar pumps due to each farmer's desire to use solar pumps, there was a negative and non-significant relationship between caste and knowledge level of farmers and a positive and non-significant relationship between size of land holding, family type, and knowledge level. At the 1% level of significance, there was a positive and significant correlation between farmers' educational attainment, social involvement, and media use and the level of knowledge of famers.(Finding Narpat 2012).

Hence, the null hypotheses $H_{01.1,}$ $H_{01.3,}$$H_{01.6,}$ $H_{01.8,}$ $H_{01.9}$and$H_{01.10}$ were rejected and alternate hypotheses were accepted. It means that caste, size of land holding, annual income and family type did not have a significant effected on the knowledge level of farmers about solar pumps.

Conclusion:

The study has demonstrated that despite farmers' awareness of solar pumps is directly related to their age, education, social engagement, occupation, interaction with extension agents, and use of mass media. The study has indicated the need for stronger financial incentives to guarantee that people learn more quickly about the usage of solar pumps for water extraction. The field workers should arrange field excursions to demonstrate the technology live and dispel respondents' doubts in order to alter the attitudes of the farmers and inspire them to learn about this solar technology.

The development of site-specific tactics, training, demonstrations, and programming is necessary. Most farmers were found to have a medium degree of knowledge. Therefore, it is advised that extension agents make an effort to arrange technology demonstrations, offer

pertinent material and training regarding the new technology, and explain how to apply for government subsidies. Age, caste, education level, size of land holding, family size, social participation, occupation, annual income, extension participation, and media participation have all been taken into account by the researcher as independent variables that an organization may take into account prior to the implementation of solar pumps.

References

Annual Report: Department of Agriculture and Horticulture, Paota, Jodhpur Rajasthan (2019).

Anonymous: Economic and political weekly report 2014.

Anonymous: Food and Agriculture Organization, SPIS Report 2019.

Annual Report (2017): Directore of Horticulture, Pant Krishi Bhawan, Jaipur, Rajasthan

Deshmukh, G. (2015). Extent of variation in dependent variables caused by selected independent variables: A statistical study. *International Research Journal of Agricultural Economics and Statistics*,**6**(1): 2231-6434.

Kumar, A., Godara, A.K., Kumar, A. and Bhatia, J.K. (2017). Knowledge level of farmers' regarding photovoltaic water pumping system: Comparative study between Hisar, Rohtak, and Jhajjar districts of Haryana state. *Indian Journal Health and Wellbeing*,**9**(5): 776-780.

Narpat, S., Dangi, K.L. and Ram, M.N. (2012). Association of selected independent variables with knowledge of recommended of mustard cultivation by farmers. Journal of Progressive Agriculture, **3**(2): 109-112.

Navinkumar, Dhananjaya, B. and Ranjith, T.H. (2019). Study on Relationship between Selected Independent Variables with Knowledge of the Mobile Agro-Advisory Services Using Farmers of Udupi District of Karnataka. *Economic Affairs 2019*, **64**(3): 583-587.

Singh, D.R., Kumar, P., Kar, A., Jha, G.K. and Kumar (2017). Solar energy use in agriculture for enhancing farmers income: A case of solar tubwell in north-western Rajasthan. *Agriculture Economics Research Review*, **30**: 269-277.