



Socio-personal and Communication Characteristics of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) Beneficiary Farmers in Uttarakhand

Babita Adhikari^{1*}, S. V. Prasad¹, P. L. R. J. Praveena¹, G. Karuna sagar¹ and B. Ravindra Reddy¹

¹*Acharya N. G. Ranga Agricultural University, S.V. Agricultural College, Tirupati 517502, A P, India.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Water is a critical resource in agriculture & allied sector and it is estimated that globally, on average, agriculture accounts for 70 percent of global freshwater withdrawals. Consequently, the management of water in agriculture (irrigation) becomes important and in this context, programmes on irrigation and water conservation have been playing pivotal role. At present, this task at central level is performed by Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). So, the research objective was formulated to study the socio-personal and communication characteristics of beneficiary farmers of PMKSY and it was undertaken during 2020-21. Uttarkashi and Dehradun districts were selected purposively and two blocks were selected in each district by simple random sampling. Three villages from each block and twenty farmers from each village were selected by following simple random sampling. Thus, the sample constituted to a total of 240 respondents. The findings revealed that majority (35.84%) of beneficiary farmers belonged for middle age group, more than two-fifth (40.00%) of the beneficiary farmers had education up to intermediate, almost two-fifth (39.17%) of the beneficiary farmers had medium farm, nearly half (49.59%) of the beneficiary farmers had medium farming experience. Moreover, beneficiary farmers (100.00%) had agriculture

*Corresponding author: E-mail: adhikaribabitapantnagar@gmail.com;

as their primary occupation, half (50.83%) of the beneficiary farmers had medium extension contact, more than half (56.67%) had medium level of mass media exposure followed, three-fifth (61.25%) beneficiary farmers had high innovativeness, 51.67 per cent PMKSY beneficiary farmers had low level of training exposure, majority (47.50%) had low social participation, 60.83 per cent beneficiary farmers had medium achievement motivation, majority (67.50%) had medium scientific orientation and majority (66.67%) of beneficiary farmers belonged to medium risk preference group. Interventions on focusing on small and marginal farmers, providing more trainings, improving extension contacts and social participation were suggested as the suitable measures for success of micro irrigation under PMKSY.

Keywords: Micro Irrigation; subsidy support; water conservation; irrigation programme; mass media exposure; extension contact; PMKSY.

ABBREVIATIONS

PMKSY : Pradhan Mantri Krishi Sinchayee Yojana
PDMC : Per Drop More Crop
MIS : Micro Irrigation System
CSRF : Cumulative Square Root Frequency
HARC : Himalayan Action Research Centre
ATMA : Agricultural Technology Management Agency

1. INTRODUCTION

Water is a scarce natural resource which is inevitable for existence of life on earth. In larger perspective, water security is fundamental to poverty alleviation, and water resource management impacts almost all aspects of economic activity, including food production and security, industry, energy production, and transport [1]. In a developing nation like India, water management hold utmost importance as India is home to 17.50 per cent of world population with only 2.5 per cent of geographical land and 4 per cent of the world's renewable water resources. In the present context, India is experiencing a very significant water crisis. As per FAO [2], agriculture is the largest water user worldwide, accounting for 70 percent of total freshwater withdrawals on average. Therefore, if humanity is facing water crises at present, then its mismanagement in agriculture should be held responsible for it to a larger extent. Meanwhile, the overall development of the agriculture sector and the targeted growth in Gross Domestic Product is largely dependent on the availability and use of water in agriculture. In India, 42.02 per cent of operational land holdings are wholly unirrigated and 12 per cent are partially irrigated. Total area under irrigation is 64.70 mha, which is 52.6 per cent of total agricultural area [[3]. With more than half of the operational land holdings

being partially irrigated or wholly unirrigated and almost half of agricultural land under irrigation (52.60%), data points towards the vast scope of irrigation management in agriculture sector of India. Furthermore, more than 80 per cent of the total water is used for agriculture in India with very low irrigation efficiency. Hence, the management of water in agriculture is utmost important in present era. Keeping this in view, irrigation related policies and programmes, watershed development, water and soil conservations initiatives of central and state government play a pivotal role in paving the way for sustainable water management in agriculture. Looking at the need of water conservation and irrigation in agriculture, Government of India and state governments since independence have been keeping efforts through programmes and policies. At present, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), launched by Central Government, is aimed to ensure access to some means of protective irrigation for all agricultural farms in the country and to produce more output per unit of water. The scheme has been launched with budget of 50,000 crore for period of 5 years (2015-16 to 2019-20). Per Drop More Crop (PDMC) includes installation of micro-irrigation systems, use of efficient water conveyance and precision water application devices like drips, sprinklers, pivots and rain-guns in the farm "(Jal Sinchan)", and extension activities for promotion of scientific moisture conservation and agronomic measures including adoption of proper cropping patterns, to maximize use of available water including rainfall and minimize irrigation requirement "(Jal Sanrakshan)". Present study focused on studying the socio-personal and communication profile of those farmers who got benefitted from the programme i.e., who received micro irrigation subsidy support under PMKSY-PDMC.

Uttarakhand state is rich in water resources as north western Himalayas in the state are originator of major river system in India but still the state is largely rainfed. As per Agriculture Census Division [4], the net irrigated area of the Uttarakhand was 3.27 lakh hectares in year 2015-16. Owing to importance of irrigation in increasing agricultural production, irrigation development programmes have responsibilities of developing irrigation system and water conservation in Uttarakhand. Because of varying geography (i.e., Tarai, Bhabhar and Hill areas), distribution of water resources, need of efficient water use and vast potential to cover area under irrigation, there is huge opportunity under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) programme to enhance production and productivity of major crops in the state. For proper implementation of any agriculture programme and its long-term success, information on various targeted audience is important and the data on beneficiaries would be beneficial for reconsideration of the programme in future also. Keeping this in mind, the study titled 'socio-personal and communication profile of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) farmers in Uttarakhand' was conducted. The present study would be providing insights on attributes of beneficiaries of the PMKSY-PDMC.

2. METHODOLOGY

2.1 Research Design

For the present study, descriptive design was used which includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present.

2.2 Sampling Procedure

The present study was carried out in month of January- March of year 2021 in Uttarkashi and Dehradun districts of Uttarakhand, which were purposively selected based on the highest fund allocation under Pradhan Mantri Krishi Sinchayee Yojana in Uttarakhand (PMKSY) from year 2015-16 to 2018-19. Two blocks i.e., Doiwala and Chakrata from Dehradun district and Naugaun and Bhatwari blocks from Uttarkashi were selected by following simple random sampling procedure, thus making a total of four blocks. Three villages from each block were selected by following simple random sampling procedure. From each of the selected

villages, twenty farmers were selected by following lottery method of simple random sampling procedure. Thus, sample size constituted of 240 respondents from twelve villages.

2.3 Selection of Variables

The focus of the study was to study socio-personal and communication characteristics of beneficiary farmers of PMKSY-PDMC. Thus, the variables of the present study were selected on the basis of extensive review of literature related to the beneficiary farmers and after thorough consultation of experts. These variables included age, educational status, farm size, farming experience, occupation, extension contact, mass media exposure, innovativeness, training undergone, achievement motivation, social participation, scientific orientation and risk preference.

2.4 Statistical Tools and Techniques Used

The data was collected with the help of pre-tested well-structured interview schedule. Data was filled in excel and basic statistical tools like frequency, percentage, arithmetic mean and standard deviation were used to analyze data. The final categories were made on the basis of Cumulative Square Root Frequency (CSRF) Method.

3. RESULTS AND DISCUSSION

3.1 Age

The Table 1 clearly depicts that most (35.84%) of the beneficiary farmers belonged to the middle age group followed by 33.33 per cent belonged to the old and 30.83 per cent belonged to the young age group respectively. The data indicates that the distribution of farmers as per age group was more or less uniform, indicating that at least one-third of beneficiary farmers were present in each age group. The reason might be that farmers of any age group were interested in receiving subsidy support provided by the government. Farmers across any age group showed interest in availing micro irrigation subsidy support provided under PMKSY. Under PMKSY, 55 per cent of subsidy support is provided for micro irrigation, which cut decrease the installation cost of MIS to a very large extent, which is very beneficial for farmers. The findings

also pointed out that majority of the farmers belonged to middle and old age group which could be due to the fact that young farmers were less interested in farming because agriculture is considered a labor-intensive work and higher degree of risk is associated with it. Moreover, due to lack of interest in farming and in search of better opportunities, they move to cities and towns for jobs and education, leaving agriculture as a profession behind. These results were in conformity with the findings reported by Malani [5] and Patidar [6].

3.2 Educational Status

The present finding reveals that more than two-fifth (40.00%) of the beneficiary farmers had education up to intermediate followed by graduation (34.59%), middle school (12.08%) and primary (4.58%) levels of educational status. Results highlight that more than three-fourth (74.59%) of the beneficiary farmers belonged to graduate or intermediate category. This might be due to the fact that there was presence of senior secondary in villages and higher educational institutions were functioning successfully in nearby towns. Moreover, farmers and their family were well acquainted with the importance of education and government institution are also putting efforts for educating masses in the study area. These results were in conformity with the findings reported by Ashok [7] and Rajput [8].

3.3 Farm Size

From the Table 1, it is clear that almost two-fifth (39.17%) of the beneficiary farmers were medium farmers followed by 25.42 per cent were semi-medium farmers, 15 per cent were small farmers, 11.25 per cent were marginal farmers and very scanty percentage (9.17%) of them were large farmers. The results are contrasting with the state statistics on agricultural land holding which says, the average size of land holding in the state is 0.95 ha and the national average land holding is 1.57 ha. On the contrary, present findings indicated that mostly medium, small and semi-medium farmer received benefits of PMKSY micro irrigation subsidy. It could be due to the fact that PMKSY provided subsidy for 0.4 ha to 5 ha of land holding. Interestingly, at implementation level, micro-irrigation system used to get installed in farm of either 0.4 ha or 1 ha and likewise. Although aggregated land holding is eligible for availing subsidy support but due problem with installation of MIS in different location and with different water source, the

process was becoming cumbersome and non-feasible for small and marginal farmers. Keeping this in view, many marginal and small farmers who owned less land or who had fragmented land holding were unable to get subsidy. Moreover, small and marginal farmers mostly in hill region grow food for their own consumption and so they might have lacked interest in adoption of micro irrigation and availing the subsidy support. This could be a probable reason behind less proportion of small and marginal farmers in above results. Meanwhile, it was also noteworthy that, many beneficiary farmers either belonged to undivided families or their close relatives migrated to other places, leaving agricultural lands on their names, which could be a probable reason for higher percentage of medium and semi-medium farm size. These results were in conformity with the findings reported by Rasouliazar and Saeidfeli [9] and Meena [10].

3.4 Farming Experience

It could be seen from the Table 1 that nearly half (49.59%) of the beneficiary farmers had medium farming experience followed by 45.83 per cent had low and 4.58 per cent had high farming experience respectively. The findings indicates that majority of the beneficiary farmers possessed medium and low farming experience. Lesser in their experience, these farmers experimented with several irrigation methods and found MIS subsidy lucrative and better for farming. Additionally, farmers with more experience in farming often perform same irrigation practices over the years and find them more comfortable which could be a reason behind a smaller number of beneficiary farmers in higher farming experience category. It could also be a reason that many beneficiary farmers invested their time in higher education and other profession in early stages of life and hence, they undertook farming in later stages of their life, which could be a probable reason behind low and medium farming experience of the beneficiary farmers. These results were in conformity with the findings reported by Prasad [11].

3.5 Occupation

It is evident from the findings that all of the beneficiary farmers (100.00%) had agriculture as their primary occupation and 21.25 per cent of them were also performing secondary occupation for securing livelihood. It was reported that 9.17

Table 1. Distribution of respondents according to their socio-personal and communication characteristics (n= 240)

Characteristics	Categories	Frequency	Percentage
Age	Young (less than 40 years)	74	30.83
	Middle (40-53 years)	86	35.84
	Old (above 53 years)	80	33.33
Educational status	Illiterate	0	0
	Can read only	0	0
	Can read and write	0	0
	Primary education	11	4.58
	Middle school	29	12.08
	High School	21	8.75
	Intermediate	96	40.00
Family size	Graduate	83	34.59
	Marginal (Below 1.00)	27	11.24
	Small (1.01 to 2.00)	36	15.00
	Semi-medium (2.01 to 4.00)	61	25.42
	Medium (4.01 to 10.00)	94	39.17
Farming experience	Large (10.01 and above)	22	9.17
	Low (<19 years)	110	45.83
	Medium (19-32 years)	119	49.59
Occupation	High (>32 years)	11	4.58
	Primary occupation		
	Agriculture	240	100
	Secondary occupation		
	Wage earner/Labour	8	3.33
Extension contact	Business/Independent profession	21	8.75
	Service	22	9.17
	Low (<14)	84	35.00
Mass media exposure	Medium (14-19)	122	50.83
	High (>19)	34	14.17
	Low (<24)	95	39.58
Innovativeness	Medium (25-29)	136	56.67
	High (>29)	9	3.75
	Low (<19)	32	13.33
Training Undergone	Medium (19-20)	61	25.42
	High (>20)	147	61.25
	Low (<1)	124	51.67
Achievement motivation	Medium (1-2)	49	20.40
	High (>2)	67	27.93
	Low (<22)	42	17.50
Social participation	Medium (22-27)	146	60.83
	High (>27)	52	21.67
	Low (<1)	114	47.50
Scientific orientation	Medium (1-3)	76	31.67
	High (>3)	50	20.83
	Low (<20)	26	10.83
Risk preference	Medium (20-24)	162	67.50
	High (>24)	52	21.67
	Low (<20)	34	14.17
	Medium (20-23)	160	66.67
	High (>23)	46	19.16

per cent of the beneficiary farmers were involved in providing service (in hotels, shops, ex-servicemen etc.), followed by 8.75 per cent had

small business or independent profession and only 3.33 per cent of them were daily wage workers or labors. These findings indicate that all

beneficiary farmers were dependent on agriculture which was major or only the source of income them and two-fifth of these beneficiaries were dependent on other occupation as well. Two kinds of patterns were observed among those farmers who performed secondary occupation. In first case, beneficiary farmers were comparatively larger, had enough resources to hire labor and their scale of production was huge. These farmers were able to open their own side business or run independent profession. Second pattern was observed among those beneficiaries who were resource poor, who had smaller farm size and for whom, agriculture was not enough to sustain their livelihood in every season. These farmers provided services in private sector settings like for tourism or worked as daily wage workers.

3.6 Extension Contact

It was found that half (50.83%) of the beneficiary farmers had medium extension contact followed by 35.00 per cent and 14.17 per cent had low and high extension contact respectively. These results infer that more than half (50.83%) of the farmers had medium extension contact, this might be due to regular contact of beneficiary farmers with assistant agricultural officers, horticulture development officers and other progressive farmers to get information and knowledge on advance agricultural and horticultural technologies. It was found that State Department of Agriculture provided various agricultural inputs like seeds, micro irrigation system, pesticides, farm equipment, subsidy support and various kind of agricultural services to farmers. It was observed that beneficiaries participated in various extension activities such as demonstrations, field visits, trainings, farmers meeting. organized by horticulture and agriculture department. The findings also highlighted that the inclination of extension contact of beneficiary farmers was towards middle and lower category which could be due to the fact that beneficiary farmers had contact mostly with government officials of State Department of Agriculture. The beneficiary farmers rarely participated in extension activities of university extension system and only very few of them visited Krishi Vigyan Kendras (KVKs). Moreover, the extension services of private agricultural companies other than MIS services were almost absent in the study area. This may be due lack of awareness on extension services provided by university extension system, KVKs, NGOs and ATMA. These results were in

conformity with the findings reported by Badakuri and Manjula [12].

3.7 Mass Media Exposure

From the Table 1, it is evident that, more than half (56.67%) of the beneficiary farmers had medium level of mass media exposure followed by 39.58 per cent and 3.75 per cent had low and high levels of mass media exposure respectively. This might be due to the fact that the beneficiary farmers mostly relied upon extension functionaries and other progressive farmers for receiving authentic information. Radio was not in use in study area and television provided general information to farmers. It was observed that some of the beneficiary farmers had exposure to farm magazines, extension publication like brochures, *Kisan Bharati* and Newspaper which was very much less in use in study area. It was observed that Mobile SMS services, Farmers' WhatsApp group and Kisan Call Centers were frequently used and more popular mass media sources. It was notable finding that educated farmers preferred mobile and internet services over television, radio and print media as a means of mass communication. Hence, it could be inferred that in era of ICT, beneficiary farmers were found to be more inclined towards the use of internet and mobile services in seeking information and discussing problems with extension workers and the use of print media and radio was at its minimal. These results were in conformity with the findings reported by Sudha [13] and Karki [14].

3.8 Innovativeness

The present results indicated that nearly three-fifth (61.25%) of the beneficiary farmers had high innovativeness followed by 25.40 per cent had medium and 13.33 per cent had low level of innovativeness respectively. This may be due to the fact that farmers were in regular contact of horticulture and agriculture officials who encouraged them to adopt micro irrigation. These results were in conformity with the findings reported by Radhika [15] and Sudha [13].

3.9 Training Undergone

It is clear from the Table 1 that 51.67 per cent of the PMKSY beneficiary farmers had low level of training followed by high (27.93%) and medium (20.40%) levels of training undergone respectively. The finding reveals that nearly half of the beneficiary farmers belonged to low training undergone category on micro irrigation

system. It could be inferred from the findings that majority of the farmers lack on trainings and demonstration on MIS because trainings were not organized regularly by government departments. Farmers reported that private input dealers and micro irrigation companies provided them with working knowledge of MIS and many of them had no exposure to trainings. Training specially on MIS were organized on part of the government were inadequate. Moreover, beneficiaries were educated and innovative and so they were able operate MIS with less training exposure. It was noteworthy to observe that most of farmers received micro irrigation subsidy without any training exposure. The beneficiaries reported that micro irrigation system in their field was installed by private agents in their fields and these agents provided them knowledge on functioning and operation of micro irrigation system in an informal manner. The results are in consonance with the findings of Rathore [16].

3.10 Achievement Motivation

It could be inferred from Table 1 that majority (60.83%) of the beneficiary farmers had medium level of achievement motivation followed by high (21.67%) and low (17.50%) level of achievement motivation respectively. Beneficiary farmers in the present study had higher educational status, enabling them to understand the benefits of improved farming practices and in addition to that, there was input and subsidy support from the government and they perceived benefits from adopted new technology, which could be a source of extrinsic motivation for beneficiary farmers. Moreover, beneficiary farmers had frequent contact with extension functionaries of State Departments and fellow progressive farmers who might have encouraged them to achieve higher returns through adoption of micro irrigation and other advance farming practices. Also, majority of the beneficiary farmers possessed semi-medium and medium land holding which increased their possibility to increase scale of production and earn higher income from latest technologies. It was also noteworthy that social media tools like WhatsApp messenger i.e., WhatsApp group of apple growers, vegetable growers etc., and Youtube channel of progressive award-winning farmers motivated them to achieve higher yields and better returns.

3.11 Social Participation

An outlook from Table 1 depicts that majority (47.50%) of the beneficiary farmers had low

social participation followed by 31.67 per cent of them had medium and 20.83 per cent had high level of social participation respectively. From the above trend it could be inferred that beneficiary farmers in the study area had low and medium social participation. The reason behind this might be that only a few social organizations were active in the village. It was reported that water user organizations, farmers' clubs, cooperatives, NGOs (HARC) were not present in the study area and farmers were personally contacted each other in the time of need. It was also reported that farmers were unsatisfactory with existing social organizations especially with gram panchayet like in case of irrigation and water management issues. Beneficiary farmers expressed that they were not important member of gram panchayat and so, their participation in panchayat was also less. So, there participation in social organizations were at minimal.

3.12 Scientific Orientation

The present finding depicts that majority (67.50%) of the beneficiary farmers had medium scientific orientation followed by 21.67 per cent had high and 10.83 per cent had low level of scientific orientation respectively. It is evident that around three-fifth (67.50%) of the beneficiary farmers were under medium scientific orientation followed by high and low scientific orientation respectively. It could be inferred that beneficiary farmers use to think scientifically in decision making regarding farming and scientific corner of any practices mattered for them. They use to apply scientific methods in agriculture and also accepted or rejected any practices as per their experience with it. The reason behind their medium and high scientific orientation might be that their higher educational status, medium extension contacts, medium mass media exposure, and comparatively bigger farm size which enable them to conduct trials and experiment with new practice in smaller portion. It is also possible that regular discussion and advisory from extension functionaries and influence of fellow progressive farmers might have oriented them to think scientifically on agricultural practices and adopt advance practices. These results were in conformity with the findings reported by Prasad [11] and Ashok [7].

3.13 Risk Preference

It is apparent from the Table 1 that majority (66.67%) of beneficiary farmers belonged to medium risk preference group followed by high

(19.16%) and low (14.17%) risk preference group respectively. This may be due the fact that mostly beneficiary farmers received more education and they were innovative. Beneficiary farmers under study possessed more land and they had decent scale of production which enabled them to take moderate risk. Moreover, beneficiary farmers were in regular contact of extension functionaries and other progressive farmers who supported them and guided them on adoption of profitable farming practices and technologies. A combination of mentioned factors might have influenced them to take risk for profit. Moreover, subsidy in case of micro irrigation supported them to take risk and adopt micro irrigation method for irrigation and water management in their farm.

These results were in conformity with the findings reported by Premising [17-21].

4. CONCLUSION

The present study indicates that beneficiary farmers were heterogenous in nature and PMKSY guidelines needs to be more flexible and inclusive in nature. The Study depicted that small and marginal percentage among beneficiary farmers was low which highlights lower adoption of micro irrigation by small and marginal farmers. So, PMKSY should make guidelines more flexible and implementable for them. It is suggested that extension functionaries should organize regular trainings and demonstrations on MI system for beneficiary farmers. Meanwhile, subsidy providers need to increase their extension linkage with beneficiary farmers and ensure after sales services. Additionally, there are opportunities to improve mass media intervention especially ICT among beneficiary farmers with regard to micro irrigation. Since, farmers were unaware of water user organization and social participation was low in formulation of district irrigation plan. So, social participation of beneficiary with regard to water conservation and irrigation must be improved.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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