



Farmers' participation in the field implementation of microirrigation system

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Abstract

The study was conducted among the farmers of Kasaragod District in Kerala state with the objective to analyse the participation of farmers in the field implementation of micro irrigation system in coconut garden. The study was conducted with an *ex-post-facto* research design among 200 adopters of micro irrigation technology. A participation index was developed for analyzing the extent of participation of farmers in the field implementation of micro irrigation system in coconut farming. The results showed that nearly one-fifth (19%) of the farmers were in the low participation category. The extent of participation of farmers in most of the activities related to the initial procurement of micro irrigation systems was fairly good. But the extent of participation of farmers was very low with respect to the activity that followed; i.e. actual field installation of micro irrigation systems in coconut gardens. Similar was the case with the activity related to the timely repair and maintenance, in which extent of participation was low. The results of the study revealed the need for strengthening efforts to create awareness among the farmers about the importance of their effective participation in the field implementation and subsequently to impart the required knowledge and skill to the farmers for the effective field implementation of micro irrigation technology.

Keywords: field implementation, micro irrigation system, participation

Introduction

Microirrigation is a farm innovation, which is in the forefront of technological alternatives for the sustainable development of agricultural sector. In order to save two thirds of the world's population from facing serious water shortages in the decades ahead, leakage and wastage of water must be reduced, especially in agriculture by following the approach, 'more crop per drop'. Microirrigation technology has great potential for high irrigation efficiencies. However, it is a relatively complex technology that calls for a meticulous system design and effective management and maintenance. Hence, it is imperative that the adopters of micro irrigation technology need to involve themselves in different stages of the field implementation of micro irrigation system in their gardens in order to derive the perceived benefits from the technology. Lack of irrigation is one of the major reasons attributed to the low level of productivity of coconut in Kerala state (Rajagopal *et al.*, 2001). Scarcity of irrigation water is also considered as one of the major constraints in resource use management in coconut farming in Kerala. Effective field implementation of

micro irrigation technology will help the farmers in the judicious use of scarce water resources for enhancing the productivity of coconut. In this background, a study was conducted to analyse the participation of farmers in the field implementation of micro irrigation system in coconut garden with the following specific objectives: (i) to study the extent of farmers' participation in the procurement, installation and operation and maintenance of micro irrigation systems in coconut gardens and (ii) to analyse its relationship between socio-personal characteristics.

Materials and Methods

The study was conducted in Kasaragod district of Kerala state. From the list of coconut farmers who have adopted drip irrigation system in each of the four development blocks, 50 coconut farmers were selected for the study through simple random sampling making a total of 200 adopters for the study.

Measurement of variables

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systems is operationalised as the degree to which the farmer is involved in person in various activities related to the field implementation of micro irrigation system in coconut garden. The extent of farmers' participation was analysed as per the following procedure:

A list of 15 activities related to the field implementation of microirrigation systems in coconut gardens was prepared by discussion with farmers adopting the microirrigation technology and extension experts. Out of the activities selected, nine were related to the procurement, two were related to the installation and four were related to the operation and maintenance.

The degree of involvement of farmer was measured on a three-point continuum, viz., 'very much involved', 'much involved' and 'less involved' with corresponding scores of 3, 2 and 1. Each of the activity was presented before the respondents and response on the three-point continuum was noted and scores given.

Participation index (PI)

Based on the scores obtained, participation index was worked out for each of the respondent using the following formula,

$$PI = \frac{\text{Total score obtained}}{\text{Maximum possible score}} \times 100$$

Based on the participation index, respondents were categorized into low, medium and high by adopting percentile method. Total scores were obtained for each of the activity by adding the scores obtained by the

individual farmer on each activity and the levels of participation were worked out.

Results and Discussion

The results pertaining to the analysis of extent of farmers' participation (participation index) in such activities related to the field implementation of microirrigation technology are discussed under the following sub-heads.

The pattern of distribution of farmers according to the participation index indicated that nearly one-fifth (19%) of the farmers were in the low participation category, about two-thirds (66.50 %) in the medium category and 14.50% were in the high category. Farmers' participation influence the quality of irrigation management (Bagadion and Korten, 1985) and the importance of farmers' participation in irrigation management was more when just enough irrigation water was available (Uphoff, 1986). Since considerable proportion of farmers fall in the low level category with respect to participation, there is a need for formulating effective extension strategies to enhance the extent and effectiveness of participation of farmers in all the activities related to field implementation of microirrigation technology.

The assessment of activity wise participation of farmers in the field implementation of microirrigation technology was done by listing the activities identified under three sub-heads, viz., procurement, installation and operation and maintenance. The results are summarized in Table 1.

Table 1. Farmers' participation in the procurement, installation as well as operation and maintenance of microirrigation systems

Item	Level of participation	Rank
Procurement		
Collecting preliminary information about microirrigation technology	49.00	13
Gathering detailed information about microirrigation technology	62.00	9
Gathering detailed information about the actual field installation	63.83	7
Internalization of information and decision to adopt	63.00	8
Contacting local extension agency to collect information about the subsidy schemes for implementing microirrigation system	65.67	5
Collecting information about the dealers and selection of the firm	83.33	3
Arranging finance	98.50	1
Purchasing microirrigation system materials	58.67	10
Availing subsidy	98.00	2
Installation		
Arranging labour for field installation	58.33	11
Field installation of the microirrigation system	35.00	15
Operation and maintenance		
Daily operation of the microirrigation system	64.00	6
Proper monitoring of the working of the system	66.67	4
Timely repair and maintenance	36.67	14
Seeking technical guidance for proper functioning of the system	57.33	12

It is evident that three activities, viz., arranging finance, availing subsidy and collecting information about the dealers and selection of the firm were the activities which secured I, II and III rank, respectively with regard to the extent of participation by farmers. All these activities were under the sub-item, procurement. It could be noted that participation in these activities was an important pre-requisite for the actual procurement of materials.

Further, under procurement, the activities like contacting local extension agency to collect information about the subsidy schemes for implementing microirrigation system, gathering detailed information about the actual field installation, internalization of information and decision to adopt, gathering detailed information about microirrigation technology and purchasing microirrigation system materials recorded higher levels of participation (more than 50%). Similarly under installation, arranging labour for field installation had a higher level of participation score (58.33). Field installation of the microirrigation system was the activity having the lower (35.00) participation level.

Proper monitoring of the working of the system, daily operation of the microirrigation system and seeking technical guidance for proper functioning of the system were the activities categorized under operation and maintenance which secured participation indices scores of more than 50. But for the activity related to the timely repair and maintenance, the participation score was low (36.67).

The results showed that the extent of participation of farmers in most of the activities related to the initial procurement of microirrigation systems was fairly good. But the extent of participation of farmers was very low with respect to the activity that followed; *i.e.* actual field installation of microirrigation systems in coconut gardens. The field installation of the system required high technical skill and only trained personnel can properly install the system in tune with the specific features of the plot. Another noteworthy observation was that many of the farmers were not even physically present while the installation work was carried out. For ensuring effective functioning of the microirrigation system afterwards, proper installation is a pre-requisite.

Hence, farmers are to be made aware of the requirements and steps involved for proper installation of the microirrigation system. For this, effective participation of farmers should be ensured in the field installation. Similar was the case with the activity related to the timely repair and maintenance, in which extent of participation was low. The finding that the activity related to collecting preliminary information about

microirrigation technology was also having only less than 50 scores of participation could be well attributed to the low level of farmers' participation in the actual field installation and operation and maintenance. The situation calls for strengthening efforts to create awareness among the farmers about the importance of their quality participation in the field implementation and subsequently to impart the required knowledge and skill to the farmers for the effective field implementation of microirrigation technology.

The socio-personal characteristics of farmers play an important role in determining their extent of participation in the field implementation of microirrigation technology. In order to assess the relationship of socio-personal characteristics of farmers with the extent of participation, correlation coefficients were worked out and the results are presented in Table 2.

Table 2. Relationship between the extent of participation of farmers and their socio-personal characteristics

Socio-personal characteristics	Coefficient of correlation (r)
Age	0.071
Educational status	0.214**
Occupation	0.210**
Family size	0.252**
Farm size	0.342**
Farming experience	0.231**
Annual income	0.596**
Economic motivation	0.109
Risk preference	0.143*
Scientific orientation	0.281**
Extension contact	0.484**
Social participation	0.043
Information source utilization	0.215**

* Significant at 5% level **Significant at 1% level

It could be observed that out of 13 independent variables studied, nine variables viz., educational status, occupation, family size, farm size, farming experience, annual income, scientific orientation, extension contact and information source utilization were found to have significant positive relationship with extent of participation at one per cent level, whereas one variable, namely, risk preference had significant positive relationship at five per cent level. Education could well generate an urge among the farmers to actively participate in various activities related to the effective field implementation of microirrigation technology. Same reasons can be attributed to the variables like scientific orientation, extension contact and information source utilization. Hence, these variables have shown positive and significant relationship with the extent of participation of farmers.

When an individual depends more on farming as a source of his livelihood, he would have time and willingness to involve more actively in carrying out various activities related to the field implementation of improved farming techniques such as microirrigation technology so as to apply the same in his farming situation. This might be the reason for significant relationship observed between occupation and extent of participation of farmers. As indicated by many earlier studies, it is generally an accepted fact that farm size is correlated to the better utilization of improved farming practices. For better utilization of innovative technologies like microirrigation, farmers should actively involve themselves in various activities related to their effective field implementation. Hence, farmers having larger holdings who are likely to make better use of technologies might have higher extent of participation in the field implementation of microirrigation technology, resulting in the significant relationship between farm size and extent of participation. More the experience an individual has in farming, higher will be his felt need for actively involving in various activities related to the field implementation of improved farm technologies. Thus, a positive and significant relationship was observed between farming experience and extent of participation of farmers. Farmers endowed with higher income might be inclined to invest more on improved farming technologies like microirrigation also are likely to involve themselves actively in various activities related to their cost effective field implementation for generating higher profit from their farm. Hence, a significant relationship was observed between the annual income of growers and their extent of participation. When the risk preference of the farmer is high, he might tend to be more venturesome and innovative to try improved farm technologies like microirrigation. Such farmers quickly identify various activities for effectively implementing the innovative technology in their field situation and actively involve in each of them so as to derive maximum benefit of the innovative practice. This might be the reason for the positive significant relationship between the risk preference of farmers and their extent of participation.

Scientific orientation also had a similar relationship with extent of participation. A cultivator having a high level of scientific orientation generally takes more interest in innovative farm technologies and tries to involve seriously in the activities for the effective field implementation of such technologies. Microirrigation being an innovative practice of many scientific dimensions will thus be more acceptable to those farmers with high level of scientific orientation. And, hence, there

is a positive and significant relationship between the scientific orientation of the farmers and level of participation in the field implementation of microirrigation technology in coconut farming. Various extension agencies are functioning at grass root level that organise educational programmes on improved agricultural practices for the benefit of farming community. 'Krishi Bhavan', the grama panchayat level office of the State Department of Agriculture, is the prominent one among them. Centrally sponsored schemes that provide incentives in the form of subsidy to farmers were implemented through Krishi Bhavan, for popularizing microirrigation technology. Obviously, farmers having high level of direct contact and access with these agencies are likely to become more aware of innovative technology like microirrigation. Hence a positive, significant relationship between extension contact and level of participation was observed. Similarly, farmers with higher information source utilization are likely to become more aware of the benefits of innovative technology like microirrigation and hence would be motivated to involve in various activities for the effective field implementation of the same. And, hence, there is a positive and significant relationship between the information source utilization of the farmers and level of participation in the field implementation of microirrigation technology in coconut farming.

Conclusion

The study revealed that the extent of participation of farmers in most of the activities related to the initial procurement of microirrigation systems was fairly good. But the extent of participation of farmers was very low with respect to the activity that followed; i.e. actual field installation of microirrigation systems in coconut gardens. Similar was the case with the activity related to the timely repair and maintenance, in which extent of participation was low. The situation calls for strengthening efforts to create awareness among the farmers about the importance of their effective participation in various activities related to the field implementation of micro irrigation technology.

References

- Bagadion, B. and D. Korten. 1985. Developing irrigators' organizations: A learning process approach. In : M. Cernea (Ed.): *Sociological variables in development*. Oxford University Press. p. 12.
- Rajagopal, V., Arulraj, S. and C. Thamban. 2001. *Interface programme for coconut development*. Central Plantation Crops Research Institute, Kasaragod.
- Uphoff, N. 1986. *Improving irrigation management with farmer participation: getting the process right*. West view Press, London.