

Constraints faced and suggested solutions by the farmers of Gujarat in adoption and operation of micro irrigation system

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ABSTRACT

Micro irrigation technologies are aggressively promoted in India by the central government, state governments and many Nongovernmental Organizations (NGOs), both local and International, by providing different kinds of financial, institutional and technical support systems. GGRC (Gujarat Green Revolution Company LTD) is the only one of its type of company or we can say, service provider, which disburse government subsidy to farmers, for easy adoption and installation of MIS throughout Gujarat state. While studying the level of adoption of Micro Irrigation System by the farmers of Patan district, we came to know about the constraints faced by users while adopting and operating the system. With suggestions to overcome those constraints. Every technology has its own positive and negative points, hence, there are few constraints or problems occurred with the use of MIS. Majority of respondents, complained about the clogging of drippers due to saline substances and water quality, breaking of online small length drippers and improper and irregular services provided by the company dealers. Few respondents mentioned about the problems such as, difficult to make equal distribution of water, and difficulty in interculturing. These constraints directly affect the adoption level of MIS by the farmers. Owners or adopters of these technologies were asked to express their problems which they frequently face during adoption or operation or maintaining the system. Few suggestions were given by the farmers or system owners themselves. Owners and adopters were asked to freely mention their suggestions to overcome these problems or constraints. Majority of farmers suggested proper and required water analysis before installation, to disburse Knowledge about suitable acid treatment for clogging, and local cooperative banks should provide facility for loan of entire system installation. Suggestions or the ways to solve these problems also play important role in extent of adoption of MIS.

Key words : Micro irrigation, socio-economic, adoption, constraints

Gujarat state receives annual rainfall of 828 mm in 35 rainy days with coefficient of variation of 50 %. There is large spatial and temporal variation in rainfall of the state. The low rainfall areas receiving less than 500 mm rainfall are comprised of Kutch district and western parts of Banaskantha and Patan district and parts of Jamnagar, Rajkot and Surendranagar districts. These are also characterized by arid climate. State has achieved agricultural growth rate at 9.6% and have carved a niche in the field of agricultural development in India. Many villages in Gujarat have adopted 100% drip and sprinkler irrigation systems to water crops.

In June 2009, more than 93,000 farmers have adopted drip irrigation for their total 1.51 lakh hectare land. Drip Irrigation system and inter-linking of 21 rivers of the state for conservation of water has made it possible for record sugarcane cultivation in the state.

Patan district from north region of Gujarat state was selected purposively for the study, due to considerable amount of adoption of micro irrigation systems found in this area. Three talukas, namely Patan, Sami and Sidhpur were selected to carry out the research work. From the study it is known that majority of farmers in Patan district, about 61% have opted for sprinkler irrigation system, followed by drip irrigation system

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adopted by 29 % of farmers and mini sprinkler system by 10 % of farmers.

Sami taluka stands on first place for highest area with 272.2 ha, land under MIS adoption in the district, followed by Patan taluka and Harij with second and third place, with area, 146.04 ha and 100.31 ha respectively. Out of the adopters of MIS only few cases were found where, loan was taken for the installation of MIS. Source of application, through which channel did the farmer reached GGRC is also studied, out of 120 respondents, 65 percent applications were reached through suppliers, 17 percent through GUVNL, hence 17 cases of FPA(Four Party Agreement) took place, and 30 percent of applications reached through GWRDC [Gujarat Water Resource Development Corporation].

METHODOLOGY

A systematic plan or programme adopted to carry out the research work or to proceed with the investigation as per the decided objectives, is known as research methodology. An appropriate sampling design so as to focus the importance of objective is also necessary. It was proposed at the outset to study the area under micro irrigation in primary stage. For this purpose the secondary source data from internet and other publications was used. A multistage random sampling was adopted as appropriate sampling procedure for the study.

After the selection of area for study, that is Patan district further it is proposed to select three talukas of Patan district having good records of such tri party agreements. Hence Patan, Sami and Sidhpur talukas selected as per the convenience for the survey. In the third stage, six villages from each taluka were randomly selected, where different numbers of farmers were randomly selected to obtain information on different aspects of the study. Keeping in view the objectives of the study, relevant variables for the study were selected on the basis of reviewed literature on the subject by consulting the experts and extension personnel.

Different variables of the study which include personal (age and education), socio-economic (land holding, annual income and irrigation facility) communication (extension contact) and psychological characteristics (economic motivation, scientific orientation, innovativeness and knowledge level) their problems and suggestions to solve those problems also have been studied.

The schedule was prepared for the adaptors of micro irrigation system to know their personal, socio- economic, communication and psychological characteristics. By the personal interviews schedule were filled and analyzed for different parameters using Excel programme.

RESULTS AND DISCUSSION

Very often, it is observed that all farmers residing in the same community do not adopt improved or modern agricultural technologies to the same extent. This happens due to the influence of specific characteristics which may be personal, socio-economic characteristics of the farmers. Other than personal characteristics, constraints and problems faced by farmers who adopted the micro irrigation system in their fields were also studied to check out the reason behind moderate adoption of micro irrigation system in the study area. Further the farmers were asked for suggestions, where we came to know about their knowledge level regarding the solution of those problems.

Farmers face the problem of clogging of pipes due to saline substances, with higher percentage. This is found to be quite common problem as Timbadia (2001) observed the major constraints were frequent clogging of dripper due to saline substances and other reasons. During the research work we came to know that saline substances are found in this area, hence farmers demand for the proper testing and water analysis before the installation of irrigation system.

They further seek for appropriate treatment of water whenever required. Problem regarding breakage of online dripper leads to the choice of inline drippers for the system installation. Improper services and assistance of irrigation company dealers is also another major problem faced by the farmers, as they lack some technical aspects of the system. Hence they suggested for proper and timely monitoring of company dealers.

Farmers find that the maintenance cost was quite higher if compared to the traditional irrigation systems, agronomic tests also take quite longer time, which is previously studied by Desai *et al.*, (1999) who revealed that the most important constraint faced by the mango orchard growers in adoption of drip irrigation set was high cost of spare parts, heavy installation expenses, lack of capital for covering entire area under drip irrigation system, he also referred to major

Table 1 Distribution of MIS owners according to constraints experienced by them in the study area.

Sr. No.	Constraints	Frequency	Percentage	Rank
1	Clogging of drippers due to saline substances and water quality.	110	91.67	I
2	Breaking of online drippers.	105	87.50	II
3	Improper and irregular services provided by the company dealers.	97	80.83	III
4	Damage caused by rats to the pipes.	89	74.16	IV
5	Lack of technical knowhow about the system.	70	58.33	V
6	High maintenance cost.	55	45.83	VI
7	Time consuming agronomic tests.	46	38.33	VII
8	Lengthy process of getting subsidy.	39	32.50	VIII
9	Difficult to make equal distribution of water.	31	25.83	IX
10	Initially requires large investment for installation.	28	23.33	X
11	Difficulty in interculturing.	27	22.50	XI

Table 2 Distribution of MIS owners according to their given suggestions for overcoming the problem or constraints:

Sr. No.	Suggestions	Frequency	Percentage	Rank
1	Proper and required water analysis before installation.	93	77.5	I
2	Knowledge about suitable acid treatment for clogging.	89	74.16	II
3	Local cooperative banks should provide facility for loan of entire system installation.	84	70.00	III
4	Appropriate training should be provided to farmers.	80	66.67	IV
5	Live demonstrations should be arranged at the field of farmer.	78	65.00	V
6	Quality of products or material should be improved.	71	59.17	VI
7	Paper work for getting subsidy should be reduced.	60	50.00	VII
8	Company dealers should be regularly monitored.	59	49.17	VIII
9	Availability of spare parts in local market with reasonable rate.	27	22.5	IX
10	Design should be developed for equal distribution of water, according to crop.	19	15.83	X

technological constraints which were frequent clogging and lack of technical knowhow.

Process for getting subsidy is also lengthy as per their requirement and another problem is initial investment, which is also higher. Thus it was suggested that local cooperative banks should provide facility for loan of entire system installation, so that such cost burden could be lightened. Further they want that appropriate training should be provided to farmers. Live demonstrations should be arranged at the field of the farmer so the dependence for maintenance be reduce.

Kalsariya *et al.*, (2003) reported that the higher initial cost of installation of drip irrigation set, uneven distribution of water due to insufficient pressure, drip irrigation is not suitable for all the crops, difficulties in interculturing, maintenance of drip irrigation sets were the major constraints faced by the farmers. Design should be developed for equal distribution of water, according to crop, so that the problem to make equal distribution of water could be solved. It could also be help in interculturing, which is also one of the

constraints faced by the farmers who go for micro irrigation systems. Hence the concerned efficiencies should take the note of the same and policy/programme should be modified accordingly, so that the farmers will be motivated towards to adoption further.

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