

People's Participation in Implementation of Soil and Water Conservation Programme: Case Study of Antisar Watershed in Kheda District of Gujarat

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ABSTRACT

The study was conducted in the Integrated Wasteland Development Project (IWDP), Antisar watershed located in Kapadwanj Taluka of Kheda district in Gujarat. It was revealed that majority more than three fourth of the respondents (76.02%) showed moderate level of participation, nearly one fifth of them (19.64%) having low participation level and few of them with high participation level in implementation of the soil and water conservation technologies in the watershed development programme. The overall extent of the male as well as female beneficiary farmers' participation in the programme at the stage of its implementation was calculated with the help of People's Participation Index (PPI) and it was found 69.29 per cent and 71.66 per cent respectively. It means that overall extent of participation of male and female farmers in the implementation stage was high level. The variables socio-economic status, farm power, risk preference, knowledge and attitude were positively and significantly correlated with the participation of male farmers in implementation of SWC programme. Whereas, the variables socio-economic status, education, family size, social participation, risk preference, knowledge and attitude were positively and significantly correlated with the participation of female farmers in implementation of SWC programme, and the variables age and income were negatively and significantly correlated with the participation of female farmers in implementation of soil and water conservation programme.

Keywords: People's participation, soil and water conservation, watershed management

INTRODUCTION

People's participation is a dynamic group process in which all members of a group contribute to the attainment of group objectives, share the benefits from group activities, exchange information and experience of common interest and follow the rules, regulations and other decisions made by the group (Banki, 1981).

Cohen and Uphoff (1980) describe participation as "people's involvement in decision making process about what would be done and how; their involvement in implementing programmes and decisions by

contributing various resources or cooperate in specific organizations or activities, their sharing in the benefits of development programmes and/or their involvement in efforts to evaluate such programmes. Taken together, these four kinds of involvement appear to encompass most of what would generally be referred to as participation in development activities."

Ingley and Kudey (1991), Pandya (1991), Nandvana (1994) and Rakholia (1996) were conducted different studies to assess the level of social participation of respondents and to find out the different variables associated with the characteristic

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of social participation of farmers. Satyamurthy (1991) studied the different obstacles faced in people's participation from heterogeneous socio-economic structure of the society and stated that the constraints in people's participation can be properly managed by apolitical, and neutral organization such as NGOS.

Tantray (1991) Kanvar (1994) and Singh (1996) were conducted different studies with the respondents as rural farm women. The findings reported that majority of agricultural activities were carried out with the participation and involvement of rural farm women in watershed management programme.

Bagdi and Joshi (2007) reported that socio economic status, land holding, knowledge, risk taking ability and attitude were positively and significantly related with the farmers' participation in planning phase of watershed programme.

People's participation can be defined as "concerted efforts by a group of local participants for achieving common goals and sharing benefits". The watershed development programmes are made for local people; hence the local people should take part in implementation of programme by contributing labour and money in construction of soil and water conservation structures on their field and community land also. The study was conducted with the main objective to study the extent of people's participation in implementation of soil and water conservation in the Antisar watershed development programme.

METHODOLOGY

The study was conducted during 2002-07 in the Integrated Wasteland Development Project (IWDP), Antisar watershed purposively, because the Antisar watershed development programme was sanctioned by the Ministry of Rural Area Employment to the Central Soil and Water Conservation Research and Training Institute, Research Centre, Vasad. The study was taken with the main objective to find out the extent of people's participation in implementation of soil and water conservation in the Antisar watershed development programme.

The Antisar watershed is spread over 812 hectares of land. Out of that 736 hectares belong to individual farmers and 76 hectares is owned by Panchayat community/Government. Antisar watershed is under Kapadwanj Taluka of Kheda district in Gujarat. The population of the study consisted of all the male and female farmers who possessed land in the Antisar watershed area as well as member of Antisar Watershed Development Society were considered as the respondents for the study. Therefore, all the 392 farmers comprised of 284 male farmers and 108 female farmers of Antisar watershed area were considered as the sample for the study. Hence, it was a population study.

Statement Intensity Index (SII): Statement intensity indices were calculated for all the statements included in the developed schedule to measure the dependent variable people's participation in implementation of soil and water conservation programme with following index:

$$SII = \frac{\sum_{i=1}^N X_i}{N} \quad (1)$$

where,

SII = Statement intensity index

$\sum_{i=1}^N X_i$ = Sum of total Scores of i^{th} respondents towards a statement.

N = Total number of respondents

The level of participation for each statement or activity was decided as following criteria:

Range of SII	Participation level
1.00 to 1.59	Low participation
1.60 to 2.59	Moderate participation
2.60 to 3.00	High participation

Measurement of variables included in the study:
(i) socio-economic and psychological variables: The socio economic traits were measured with the help of available scale of Trivedi and Parekh (1963) with modifications. The psychological traits viz., risk

preference towards adoption of improved SWC technologies, knowledge regarding SWC technologies, attitude towards participation in watershed programme and adoption of SWC technologies were measured with the developed scales by the investigators. (ii) People's Participation Index (PPI): A detailed structured three-point continuum schedule was developed by the investigator to assess the extent of people's participation in implementation of soil and water conservation programme. The responses of the respondents were recorded in the specially developed three point continuum schedule *viz.*, great extent, some extent and least extent and scores were assigned as 3, 2 and 1 respectively. All the respondents were grouped into three categories on the basis of the total scores obtained by them in people's participation in implementation stage of SWC programme as follows:

Range of scores	Categories
<Mean - SD	a) low participation
Mean - SD to Mean + SD	b) Moderate participation
>Mean + SD	c) High participation

The overall extent of people's participation in implementation stage of SWC programme in Antisar watershed was measured by the People's Participation Index (PPI) as given below Bagdi (2002):

$$PPI = \frac{\text{Mean Participation Score (P)}}{\text{Maximum Participation Score}} \times 100 \quad (2)$$

where,

$$P = \frac{\sum_{i=1}^N P_i}{N} \quad (3)$$

where,

N = Total number of respondents

$$P_i = \frac{\sum_{j=1}^K (PI_j)}{K} \quad (4)$$

where,

PP_j = Total scores of people's participation in programme implementation for jth statement

K = Total number of statements on which responses of the respondents were recorded.

Categorization of PPI: The overall people's participation index in a particular watershed development programme can also be categorized into three categories as suggested by the authors based on the normal distribution curve values as given below.

Normal distribution curve range	PPI value range	People's participation category
< Mean - S.D.	0 to 34.13	Low level
Mean ± S.D.	34.14 to 68.26	Moderate level
> Mean + S.D.	68.27 to 100	High level

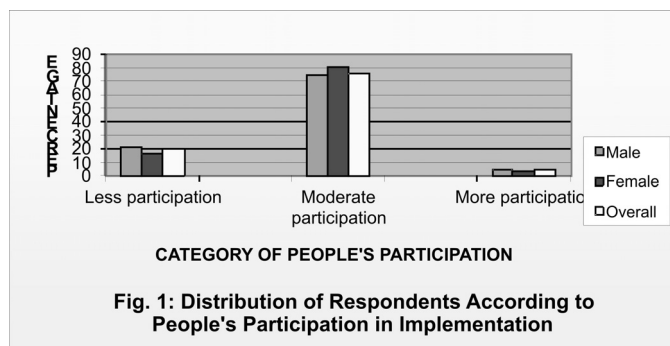
Measurement of relationship between participation in implementation and independent variables: The Pearson's coefficient of correlation (r) technique was used to measure the interrelationship in between socio economic and psychological traits with people's participation in implementation.

RESULTS AND DISCUSSION

People's participation levels in implementation of SWC programme: People's participation in implementation stage of soil and water conservation programme of Antisar watershed was grouped into three levels according to total score obtained by respondents i.e. low participation, moderate participation and high participation as presented in table 1.

The Table 1 and figure 1 reveal that more than three fourth of the overall respondents (76.02%) showed moderate level of participation, nearly one fifth of them (19.64%) having low participation level and few (4.34%) of them with high participation level in implementation of the soil and water conservation programme.

However, the Table 1 further indicates that nearly three fourth of the male respondents (74.29%) had moderate level of participation in implementation of the SWC programme. Then followed about one fifth of them (20.78%) with low participation level and about five per cent of them having higher participation in implementation of the soil and water conservation programme. Whereas, majority of female respondents



(80.55%) were exhibited moderate level of participation in implementation. They were followed by about fifteen per cent of them with low participation level and few (2.78%) of them having high participation level in implementation of the SWC programme. Similar findings regarding people's participation in rural development programme were also reported in studies by researchers like Sen (1986), Suresh (1990), Kulkarni (1991) and Bagdi & Joshi (2007).

People's participation during implementation phase of the SWC programme: The table 2 shows that the intensity indices of participation in the programme at the stage of implementation on the part of the male respondents ranged from 1.80 to 2.78. The male respondents showed high intensity index in allowing Programme Implementing Agency (PIA) to implement SWC programme works (2.78). This indicates that the male farmers were highly agreed with implementation of Antisar watershed development programme.

The male respondents showed moderate level of participation in implementation activities such as asking their fellow resource users to contribute with labour and money towards construction of SWC structures (2.42), helping during plantation work of fruit plants (2.12), providing help in plantation work of forest plants (2.11), providing material to help

Table 1: Distribution of the respondents according to their participation levels in implementation stage of SWC programme

Participation levels in implementation	Respondent		Overall (%)
	Male (%) N=284	Female (%) N=108	N=392
Low participation (<17.32 scores)	20.78	16.67	19.64
Moderate participation (17.32 to 24.53 scores)	74.29	80.55	76.02
High participation (>24.53 scores)	4.93	2.78	4.34
Total	100.00	100.00	100.00
	Mean = 20.933	SD = 3.604	

Table 2: Intensity indices of the extent of people's participation in the SWC programme implementation stage

Statements	Intensity indices	
	Male	Female
Allow programme implementing agency (PIA) to implement soil and water conservation programme works.	2.78	2.92
Ask fellow resource users for labour and money contribution towards construction of structures.	2.42	2.52
Help during plantation work of fruit plants.	2.12	1.77
Help in plantation work of forest plants.	2.11	2.02
Provide any material to help construction of soil and water conservation structures.	2.00	2.22
Provide equipment to the PIA during construction of soil and water conservation measures.	1.99	2.08
Provide help during purchase of materials.	1.98	2.08
Contribute money in construction of SWC structures.	1.95	2.13
Contribute labour in construction of SWC structures.	1.89	1.97
Participate in training programme on the soil and water conservation programme organized by the PIA.	1.80	1.94

construction of SWC structures (2.00), providing equipment during construction of SWC measures (1.99), providing help during purchase of construction materials (1.98), contributing with money in construction of SWC structures (1.95), contributing with labour in construction of structures (1.89), and participating in training programme on the soil and water conservation technologies organized by PIA (1.80). These findings indicate that the male respondents had moderate participation in the activities of watershed programme implementation and they contributed material, labour and money in construction of structures, provided help during plantation works in watershed.

The overall extent of the male respondents' participation in the programme at the stage of its implementation was calculated also with the help of the People's Participation Index (PPI) and it was found 69.29 per cent. It means that extent of participation of male farmers in the implementation stage was high level.

The table 2 further shows the intensity indices of participation in the programme at the stage of implementation on the part of the female farmers. It ranged from 1.77 to 2.92. They showed high intensity index in allowing PIA to implement SWC programme works (2.92). This indicates that the female farmers also allowed PIA to implement conservation works on their fields in the SWC programme during implementation with considerably high participation.

The female respondents showed moderate intensity indices in implementation of Antisar watershed development activities such as asking fellow resource users to contribute with labour and money to construction of SWC structures (2.52), providing materials to help the construction of SWC structures (2.22), contributing money in construction of SWC structures (2.13), providing equipment to the Project Implementing Agency (PIA) during construction of SWC measures in watershed (2.08), providing help during purchase of construction materials (2.08), helping during plantation of forest plants (2.02), contributing with labour to help construction of

SWC structures (1.97), participating in training programme on the soil and water conservation technologies organized by the PIA (1.94) and helping in plantation work of fruit plants (1.77). This indicates that the female respondents moderately participated in contribution of materials, labour and money in construction of structures and also provided help in plantation of fruits and forest plants during implementation stage of the SWC programme.

The overall extent of female farmers' participation in the SWC programme implementation stage was calculated also with help of the People's Participation Index (PPI) and it was found 71.66 per cent. It reflects that the extent of female respondents' participation in implementation stage was also high level.

Relationship between the participation of male farmers in implementation of soil and water conservation programme and selected independent variables: The data regarding coefficient of correlation between the participation of male and female farmers in the implementation of the SWC programme during Antisar watershed development and the selected independent variables is presented in Table 3. The variables socio-economic status, farm power, family size, social participation, risk preference, knowledge, attitude and adoption were positively and significantly correlated with the participation of male farmers in implementation of SWC programme. Whereas, the variables age, land holding, income were non-significantly correlated with the participation of male farmers in implementation of SWC programme. The variable education was found negatively and significantly correlated with the participation of male farmers in implementation stage watershed programme (Table 3). The study has revealed that with the increase in the socio-economic status, farm power, family size, social participation, risk preference, knowledge, attitude and adoption towards SWC programme, the participation of male farmers in implementation of the soil and water conservation programme was also increased significantly. This indicates that rural male farmers with high level of socio-economic status can have greater participation

Table 3: Coefficient of correlation between the people's participation in implementation of the SWC programme and the selected independent variables

Independent Variables	Male Farmers		Female Farmers	
	r values	t Values	r values	t Values
Age	-0.016	-0.269	-0.240	-2.545*
Socio-economic status	0.200	3.427**	0.302	3.261**
Land holding	0.090	1.517	0.191	2.003*
Education	-0.153	-2.599**	0.346	3.797**
Farm power	0.211	3.624**	0.173	1.808
Family size	0.182	3.108**	0.445	5.116**
Income	0.016	0.269	-0.258	-2.749**
Social participation	0.120	2.029*	0.241	2.556*
Risk preference	0.538	10.716**	0.262	2.795**
Knowledge	0.579	11.923**	0.634	8.440**
Attitude	0.590	12.269**	0.322	3.501**
Adoption	0.190	3.249**	0.079	0.816

* Significant at 5 per cent level of probability.

** Significant at 1 per cent level of probability.

at the implementation stage with contribution of money or materials. A farmer with high socio economic status means to have more resources, implements, machinery and materials. As a result, they can contribute with implements, machines and materials during the implementation and construction of SWC structures on their land and on a land owned by the community.

Farm powers in the form of animal power, mechanical power, irrigation facilities and farm implements *etc.* enhance male farmers' active participation and adoption of different soil and water conservation structures during the implementation stage. Large family size can provide more human resource to participate in implementation of SWC technologies in their fields by contributing more labour. With large families in villages, male farmers may get a chance to involve them in soil and water conservation works and in adoption of different soil and water conservation structures. It is also a fact that most decisions in implementation and adoption of SWC structures are taken by head of the family. The male farmers having more social participation such as more contact and relations with rural village institutions, they can contribute more in implementation of watershed programme by suggesting

good ideas in implementation of watershed activities. Rural male farmers who have more contacts with officials of rural village institutions and extension agencies can contribute effectively participation in planning and during implementation of SWC programme. Farmers expressed desire that the expenses required for construction of SWC structures on their fields and community land should be contributed from the government money through the PIA.

Risk preference of rural male farmers was observed positively and significantly correlated with their participation in implementation of the soil and water conservation programme. Farmers with higher risk preference are usually oriented towards maximization of income from agriculture. They adopt different new soil and water conservation structures on their land even at high cost. They have risk taking ability and are capable to contribute labour and money to project implementing agency during the construction of new SWC structures on their field and the land owned by the community. This ensures increase of sustainable agriculture production even from degraded and sloppy lands. Level of knowledge among rural male farmers regarding soil and water conservation technologies was also observed positively and significantly correlated with male's participation in implementation of the soil and water conservation programme. It is a fact that if male farmers have improved

knowledge level regarding soil and water conservation technologies they are capable of utilizing that knowledge for effective participation in implementation of soil and water conservation structures on their land. It would help to generate more income. If male farmers keep more favourable attitude towards soil and water conservation programme they may allow the project implementing authority to go ahead with implementation of soil and water conservation programme on their land. They might also impart substantial contribution to participation and in the form of labour and money to help implementation of soil and water conservation programme in their village. More adoption of soil and water conservation technologies by male farmers in their fields also increases their participation in implementation soil and water conservation technologies for watershed management. It is also a fact that if rural male farmers have adopted more soil and water conservation technologies on their land, they are likely to participate in implementation of soil and water conservation structures on their land because more soil and water conservation structures are required to implement for reclamation of their field conditions.

It was also revealed that any increase in the education of male farmers decreased their participation in implementation of watershed programme interventions significantly; it may be due to fact that the educated farmers more like to other occupations rather than agriculture. Educated male farmers possess little experience of working in agricultural fields. It might be because educated young male farmers are more interested in government jobs and businesses rather than to go for agriculture cultivation as their main occupation. Educated farmers in spite of knowledge, lack in practical skills to carry out different agricultural functions. They are out of the habit of working hard in fields. Therefore, they are unable to contribute their own labour and skill during the construction of SWC structures on their fields and that of the community land.

Therefore, the Null hypotheses stating that there will be no significant relationship between the participation of male farmers in the implementation of the SWC programme and the socio-economic status, education, farm power, family size, social participation, risk

preference, knowledge, attitude and adoption were not accepted (Table 3).

Relationship between the participation of female farmers in implementation of soil and water conservation programme and selected independent variables: The table 3 further shows that the variables socio economic status, land holding, education, family size, social participation, risk preference, knowledge and attitude were positively and significantly correlated with the participation of female farmers in implementation of SWC programme. Whereas, the variables age and income were negatively and significantly correlated with the participation of female farmers in implementation of soil and water conservation programme. The study revealed that any increase in the socio economic status, land holding, education, family size, social participation, risk preference, knowledge and attitude towards SWC programme affects increased participation of female farmers in implementation of soil and water conservation programme. Whereas, any increase in the age and income of female farmers' affects decrease in their participation in implementation of soil and water conservation programme.

Socio-economic status of rural female farmers operates as factor highly positively and significantly correlated with their participation in implementation of the soil and water conservation programme. It indicates that rural female farmers with high level of socio-economic status participate more by contributing equipment, materials, machinery and money in implementation of SWC programme and also through actual adoption of practices. Size of land holding of rural female farmers was observed positively and significantly associated with female farmers' participation in implementation of soil and water conservation programme. It is due to the fact that the large sizes of land holdings usually have undulating topography and are also sloppy. Hence, they are conducive and suitable for adoption of different Soil and water conservation structures on their land. Education among rural female farmers was found positively and significantly correlated with their participation in

implementation of the SWC programme. The reasons might be that educated female farmers in rural areas are capable of supporting and help their spouses in their decisions related to farming. They can also help in making their families financially sound with additional income from their side. Educated women help male farmers also in budgeting and planning of agricultural resources. They, thus, support their spouses to affect increase in agricultural production by adopting SWC measures. The size of a family works as a probable reason for positive and significant correlation of female farmers' participation in implementation of the soil and water conservation programme. The more is the number of persons in a family, the higher would be rural women's involvement and participation in implementation of the soil and water conservation programme. Large sized families have yet one more advantage in the form of more helping hands in agricultural operations. This allows female farmers to spare themselves for soil and water conservation works and hand over household tasks to other family members. They may also put to use the labour work contributed by their family members in implementation of SWC structures on their agricultural fields.

Female farmers in villages who have more contacts with rural village institutions and extension agencies can keep abreast of the latest innovations regarding soil and water conservation. They can also utilize that knowledge in implementation of the SWC programme. They can also offer help and guidance to other farmers, as and when needed, to affect proper implementation of different soil and water conservation structures on their land and that of community. They may also allow easy participation of labour and money. Risk preference of rural female farmers was observed as highly positively and significantly correlated with female's participation in implementation of the soil and water conservation programme. It is a noteworthy fact that the higher risk preferred rural female farmers are oriented towards maximization of income from agriculture and they do it by adopting different soil and water conservation structures on their land. If female farmers in villages have better knowledge level regarding soil and water conservation technologies, they can utilize that

knowledge during implementation phase of the SWC programme. The highly knowledgeable women can contribute with more guidance and suggestions during implementation of soil and water conservation structures on their land as well as on that of the community land. It ensures sustainable agricultural production and generates more income. Attitude of rural female farmers towards soil and water conservation programme was also observed highly positively and significantly correlated with their participation in implementation of soil and water conservation programme. It might be due to more favourable attitude of female farmers towards soil and water conservation programme, which is likely to allow project implementing authority to implement soil and water conservation programme on their land. They might also contribute more significantly by motivating other fellow farmers to adopt soil and water conservation structures on their land.

It was also revealed that factors like age and income were negatively and significantly correlated with female farmers' participation in implementation of the Soil and Water conservation programme. The fact remains that old rural female farmers are physically weak and have lower capacity for hard tasks. This unable them to contribute with hard labour work efficiently in their agricultural fields during implementation phase of the soil and water conservation programme with adoption of conservation structures. Old women in villages remain busy in rearing their children in the day time. Similarly, the rich female farmers are not really interested to undertake agricultural works. They attach to it the point of view of their prestige in the society. They hire labourers on their farms and get the work done. These works include land leveling, bunding, summer ploughing, mulching, weeding, harvesting etc. Rich female farmers hire even poor labourers from outside to carry out their household works such as cutting of fodder, supply of fodder to animals, cutting of fuel wood for kitchen and threshing of cereals and pulses for home etc. It is generally noticed that rich female farmers in rural area are much bothered about their status and prestige in the society.

The Null hypotheses stating that there will be no significant relationship between the participation of female

farmers in the implementation of the SWC programme and the age, socio-economic status, land holding, education, family size, income, social participation, risk preference, knowledge and attitude were not accepted (Table 3).

CONCLUSION

It can be concluded from the study that the young age rural male and female farmers should be given priority in implementation of soil and water conservation programmes on watershed basis. Farmers should be motivated to maintain adequate farm power viz. implements, machines etc. they are helpful in the soil and water conservation works. Efforts should be made so that the farmers may develop in their character risk taking ability. It may help them to adopt new soil and water conservation technologies and derive maximum benefits from them with increase in agriculture production. Skill oriented training programme should be organized by experts at village level for both male and female farmers, during watershed development programme to improve their knowledge regarding soil and water conservation interventions. Low cost soil and water conservation technologies that may suit most to marginal and small land holdings should be disseminated to farmers for easy adoption.

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