PEOPLE'S PARTICIPATION IN SOIL AND WATER CONSERVATION FOR SUSTAINABLE AGRICULTURAL PRODUCTION IN THE ANTISAR WATERSHED OF GUJARAT

AN ABSTRACT SUBMITTED TO

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE AWARD OF THE DEGREE

OF

DOCTOR OF PHILOSOPHY

(HOME SCIENCE)

IN

EXTENSION AND COMMUNICATION

GUIDE
DR. UMA JOSHI

INVESTIGATOR
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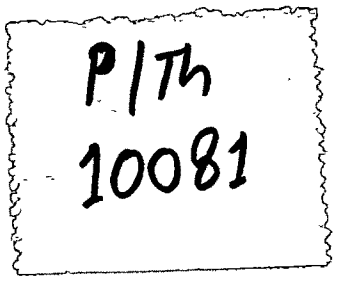

DEPARTMENT OF HOME SCIENCE

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ABSTRACT

1.0 INTRODUCTION

1.1 Soil and Water Conservation through Watershed Management:

At present very high priority has been accorded by the government of India to the holistic and sustainable development of rainfed areas based on the Watershed Approach. Indeed, the watershed approach represents the principal vehicle for transfer of rainfed agricultural technology. A watershed (or catchment) is a geographic area that drains to a common point, which makes it an ideal planning unit for conservation of soil and water. A watershed may comprise one or several villages, contain both arable and non-arable lands, various categories or land-holdings and farmers whose actions may impact on each others' interest. The watershed approach enables a holistic development of agriculture and allied activities in the area taking into account various kinds of land-se based on crops, horticulture, agro-forestry, silvi-pasture and forests. This system based approach is the special feature that distinguishes watershed development from earlier plot/field based approach to soil and water management.

A large number of projects for productivity enhancement are being implemented based on the watershed approach This is being done both through centrally sponsored schemes of the government, externally aided

projects and private initiatives of local communities and NGOs. The largest project in terms of scope and extent is the National Watershed Development Project for rainfed Areas (NWDPRA), being implemented by the Ministry of Agriculture. Impact evaluation studies both on the ground and through remote sensing techniques have shown that watershed-based interventions have led to increase in ground water recharge, increase in number of wells and water bodies, enhancement of cropping intensity changes in cropping pattern, higher yields of crops and reduction in soil losses. While there were major visible gains, the problem of sustainability continued to plague the first generation watershed development projects as evidenced by the unwillingness of local communities to operate and maintain complete structures and plantations on community property. The beneficiaries were too often merely passive recipients rather than active participants in the development of their watersheds. The restructured, second generation, watershed projects have kept people's participation at centre-stage.

The NWDPRA has been restructured by retaining the technical strengths of the older programme and incorporating the lessons learnt from successful projects, especially on community participation. It is now mandatory for the "Watershed development" to be planned, implemented, monitored and maintained by the watershed community themselves. Moreover, to bring about uniformity in approach between the watershed based programmes being implemented by various agencies, the revised Guidelines of NWDPRA are in conformity with the Common Approach for Watershed Development, jointly

formulated and adopted by the Ministries of Agriculture and Rural Development. It is expected that the revised NWDPRA will truly become a people's movement for development of land and water resources, and for enhancing productivity in rainfed areas on a sustainable basis.

A "Common Approach for Watershed Development" was jointly formulated and adopted by the Ministry of Agriculture and the Ministry of rural Development (MoRD), Government of India incorporating (Th) strength of their earlier first generation-based watershed programmes. These Guidelines have been developed for implementing the National Watershed Development Project for Rainfed Areas (NWDPRA) programme of the Ministry of Agriculture. The restructured NWDPRA provides for decentralization of procedures, flexibility in choice of technology and provisions for active involvement of the watershed community in planning, execution and evaluation of the programme so that the programme becomes sustainable.

1.2 People's Participation:

People's participation is a central component of current thinking about rural development. Policy makers, administrators and donor agencies generally agree that until and unless rural people participate in rural development programmes, such programmes, administered by outside agencies remain outside the ambit of the rural community which can adversely affect the result of such programmes. The United Nations Development Programme (UNDP) in the Human Development Report, 1993, has

commented, "People's participation is become in the central issue of our times". The approach paper to the Ninth Plan has also emphasized the importance of people's participation.

The prosperity and development of watershed area depends on participation of rural farmers as well as farm women in planning, implementation and maintenance of soil and water conservation structures. The rural farm women actually contribute more in economic terms. In addition to various economic activities of rural farm women, they also participated in soil and water conservation management activities by way of self doing. The rural farm women participate in production, processing and generating household income. They are able to run the family with the local available resources. Considering these facts the rural farm women were also included as respondents in the present study.

People's participation was defined by the investigator as "concerted efforts by a group of local participants for achieving common goals and sharing benefits". Participation of rural farmers and farm women in soil and water conservation programmes at different stages such as planning, implementation and maintenance is inevitable. Participation of local people at the time of programme planning of soil and water conservation projects is much needed to take decisions, according to their basic needs. The programme should meet the basic need like, irrigation and drinking water, fodder for cattle and fuel for kitchen of local village people. The participation of local people in programme implementation

and maintenance work is also much required because without protection and care of soil and water conservation structures by local village people the programme will not be successful. The village local people will be the ultimate beneficiary of soil and water conservation programme through watershed basis, therefore, such rural development programme should be made for the local people, by the local people and of the local people. The present study was conducted in Antisar watershed of Kapadvanj Taluka in Kheda district of Gujarat state.

1.3 Major Objectives of the Study

The study was taken up with the following specific objectives:

1) To study the overall extent of people's participation in soil and water conservation programme in the Antisar watershed.
2) To study the extent of people's participation in planning of soil and water conservation programme in the Antisar watershed.
3) To study the extent of people's participation in implementation of soil and water conservation programme in the Antisar watershed.
4) To study the extent of people's participation in maintenance of soil and water conservation programme in the Antisar watershed.
5) To study the relationship between the overall extent of people's participation in soil and water conservation programme and the following variables:

1. Gender
2. Age
3. Socio-economic status (overall)
4. Socio-economic status (specific indicators):
   i) Family Land holding
   ii) Education
   iii) Farm power
   iv) Family size
   v) Family income
5. Social participation
6. Risk preference
7. Knowledge regarding SWC technologies
8. Attitude towards SWC programme
9. Adoption of SWC technologies

6) To study the relationship between the extent of people's participation in planning of soil and water conservation programme and the following variables:
   1. Gender
   2. Age
   3. Socio-economic status (overall)
   4. Socio-economic status (specific indicators):
      i) Family land holding
      ii) Education
      iii) Farm power
      iv) Family size
      v) Family income
   5. Social participation
   6. Risk preference
   7. Knowledge regarding SWC technologies
   8. Attitude towards SWC programme
   9. Adoption of SWC technologies

7) To study the relationship between the extent of people's participation in implementation of soil and water conservation programme and the following variables:

   1. Gender
   2. Age
   3. Socio-economic status (overall)
   4. Socio-economic status (specific indicators):
      i) Family Land holding
      ii) Education
      iii) Farm power
      iv) Family size
      v) Family income
   5. Social participation
   6. Risk preference
   7. Knowledge regarding SWC technologies
   8. Attitude towards SWC programme
   9. Adoption of SWC technologies

8) To study the relationship between the extent of people's participation in maintenance of soil and water conservation programme and the following variables:

   1. Gender
   2. Age
   3. Socio-economic status (overall)
   4. Socio-economic status (specific indicators):
      i) Family Land holding
      ii) Education
      iii) Farm power
      iv) Family size
      v) Family income
   5. Social participation

6. Risk preference
7. Knowledge regarding SWC technologies
8. Attitude towards SWC programme
9. Adoption of SWC technologies

9) To identify the constraints faced by the farmers and farm women during development of soil and water conservation programme of Antisar watershed.

10) To suggest an appropriate participatory approach for sustainable agricultural production in watershed management.

1.4 Assumptions of the Study

1. The rural farmers and farm women participate in planning, implementation and maintenance of soil and water conservation programme in their area.
2. The rural farmers and farm women vary in their following traits:
   1. Gender
   2. Age
   3. Socio-economic status (overall)
   4. Socio-economic status (specific indicators):
      i) Family Land holding
      ii) Education
      iii) Farm power
      iv) Family size
      v) Family income
   5. Social participation
   6. Risk preference
   7. Knowledge regarding SWC technologies
   8. Attitude towards SWC programme
   9. Adoption of SWC technologies

1.5 Null Hypotheses of the Study

1. There will be no significant relationship between the overall people's participation in soil and water conservation programme and the following variables:
    1. Gender
    2. Age
    3. Socio-economic status (overall)
    4. Socio-economic status (specific indicators):
        i) Family land holding
        ii) Education
        iii) Farm power
        iv) Family size
        v) Family income
    5. Social participation
    6. Risk preference
    7. Knowledge regarding SWC technologies
    8. Attitude towards SWC programme
    9. Adoption of SWC technologies
2. There will be no significant relationship between the extent of people's participation in planning of soil and water conservation programme and the following variables:
    1. Gender
    2. Age
    3. Socio-economic status (overall)
    4. Socio-economic status (specific indicators):
        i) Family Land holding
        ii) Education
        iii) Farm power
        iv) Family size
        v) Family income

5. Social participation
6. Risk preference
7. Knowledge regarding SWC technologies
8. Attitude towards SWC programme
9. Adoption of SWC technologies

3. There will be no significant relationship between the extent of people's participation in implementation of soil and water conservation programme and the following variables:
   1. Gender
   2. Age
   3. Socio-economic status (overall)
   4. Socio-economic status (specific indicators):
      i) Family land holding
      ii) Education
      iii) Farm power
      iv) Family size
      v) Family income
   5. Social participation
   6. Risk preference
   7. Knowledge regarding SWC technologies
   8. Attitude towards SWC programme
   9. Adoption of SWC technologies

4. There will be no significant relationship between the extent of people's participation in maintenance of soil and water conservation programme and the following variables:
   1. Gender
   2. Age
   3. Socio-economic status (overall)
   4. Socio-economic status (specific indicators):
      i) Family Land holding

ii) Education
iii) Farm power
iv) Family size
v) Family income

5. Social participation
6. Risk preference
7. Knowledge regarding SWC technologies
8. Attitude towards SWC programme
9. Adoption of SWC technologies

1.6 Limitations of the Study

The study has been undertaken as a student research project and consequent upon the time and other resources available with the investigator, the following are the limitations of the study.

1. The study is delimited to the farmers and farm women of the Antisar watershed.
2. The study of people's participation in soil and water conservation programme in Antisar watershed is delimited to the following phases of the programme:
   i) Programme planning
   ii) Programme implementation
   iii) Programme maintenance

2.0 METHOD OF PROCEDURE

2.1 Population of the Study

The population of the study was consisted of all the farmers and farm women who possessed land in the Antisar watershed area. All the members of Antisar Watershed Development Society including men and women were considered as the respondents for the study. The total 392 respondents comprised of 284 male farmers and 108 female farmers of Antisar watershed development society. Since, the size of the population in watershed area was small, all the farmers as well as farm women were considered as the sample for the study. Hence, it was a population study.

2.2 Research Tools for Data Collection

Interview schedule having seven sections was constructed as a tool for collection of data. The items of the interview schedule were prepared as follows:

Section I: Background Information

The first section of the interview schedule consisted of a checklist on the background information of the respondents.

The socio economic characteristics of the respondents included in the study were as follows:

VARIABLES	MEASUREMENT TOOLS
A. Independent variables:	
1. Gender	Structured checklist prepared
2. Age	Structured checklist prepared
3. Socio-economic status (overall)	Standardized scale developed by Pareek & Trivedi (1963) was used with modifications.
4. Socio economic status (specific indicators):	Standardized scale developed by Pareek & Trivedi (1963) was used with modifications.
i) Family land holding	Structured checklist prepared
ii) Education	Structured checklist prepared
iii) Farm power	Structured schedule developed
iv) Family size	Structured schedule developed
v) Family income	Structured schedule developed
5. Social participation	The investigator developed structured schedule. The responses were asked to respondents as member or office bearer of any rural social organization in past or present (appendix II).

Section II: Risk Preference:

The second section of the interview schedule consisted of a scale of the risk preference of the farmers in adopting of new improved soil and water conservation practices. The risk preference scale consisted of total ten statements. There were five negative and five positive statements.

Section III: Knowledge regarding Soil and Water Conservation technologies:

The third section of the questionnaire consisted of fourteen open-end type questions regarding the knowledge of the rural male and female farmers towards soil and water conservation technologies. A scale was developed by the investigator to measure the knowledge level of farmers regarding soil and water conservation technologies. The scale consisted of fourteen statements, with equal number of negative and positive statements. The scale has two-point responses system as yes or no.

Section IV: Attitude towards SWC Programme

The fourth part of the tool of the questionnaire consisted of attitude scale towards development of SWC programme. A type attitude scale was developed by the investigator to measure what. The responses were sought on a three-point continuum as agree, neutral and disagree.

Section V: Adoption Scale of Soil and Water Conservation Technologies

The fifth part of the questionnaire consisted of the adoption scale of the different soil and water conservation technologies related to (i) Agronomy (ii) Engineering and (iii) Forestry. An adoption scale having three point respondent system was developed by the investigator.

Section VI: People's Participation in Different Stages of Soil and Water Conservation Programme

Sixth part of the questionnaire consisted of three point rating scale to measure extent of people's participation in different stages of soil and water conservation programme. It consisted of total 30 statements and equally divided into three sub-headings according to the phases or stages of rural development programme that is:

(i) People's participation in programme planning stage.

(ii) People's participation in programme implementation stage.

(iii) People's participation in programme maintenance stage.

Section VII: Constraints Faced by Farmers during Development of SWC Programme

Seventh part of the tool consisted of two point rating scale to study the constraints faced by the rural male and female farmers during development of soil and water conservation programme in Antisar watershed. It consisted of total thirteen statements related to the constraints.

2.3 Procedure of Collection of Data

The tools were translated into Gujarati language to facilitate the respondents to easily understand the

quarries. The respondents were contacted personally at their work places or at their residences in an informal way and data were collected personally by the investigator.

2.4 Scoring and Categorization of Data

The scoring, categorization and measurement of all the independent and dependent variables were done.

2.5 Statistical Analysis

The following statistical measures were used in present research study for analysis of data.

PURPOSE	STATISTICAL MEASURES
Distribution of the respondents in terms of their variables.	Percentage, Mean, Standard deviation
Correlation between independent and dependent variable	Pearson's coefficient of correlation(r)
Correlation between continuous variable and dichotomous variable	Point Biserial Correlation (r_{pbi})
Compute correlation coefficient between the rank orders of constraints faced by male and female farmers.	Spearman ranks coefficient of correlation $p^{(rho)}$

3.0 MAJOR FINDINGS

3.1 Background Information

3.1.1 Gender:

Little less than three fourth of the respondents were male, whereas, little more than one fourth of the respondents were female.

3.1.2 Age:

The overall, two third of the male and female respondents belonged to middle age, little more than one fourth were young and very few of the respondents belonged to the old age group.

3.1.3 Socio-economic status:

Three fourth of both the male and female respondents belonged to medium socio-economic status and remaining one fourth of them belonged to low and high socio-economic status.

3.1.4 Land holding:

It was found that little less than fifty per cent of both the male and female land holders were medium land holders and followed by little less than one third belonged to the small land holders. The remaining about one fifth belonged to marginal, large and very large categories of land holders.

3.1.5 Education:

Overall, little more than forty per cent of male and female respondents had primary education, followed by little less than forty per cent having education upto secondary level. Whereas, only 14.54 per cent were illiterate and 4.59 per cent were graduate.

3.1.6 House:

Overall, about sixty per cent of male and female respondents had their own kachcha house, followed by 17.60 per cent having own semi-pucca house, 11.22 per cent had own pucca house and 10.20 per cent had own hut. Only 2.04 per cent of the overall male and female respondents did not have their own house.

3.1.7 Occupation:

Overall, majority (88.27%) of the male and female respondents had cultivation as their occupation and only 11.73 per cent of respondents had labour work as their main occupation.

3.1.8 Caste:

Overall, more than fifty per cent of male and female respondents belonged to backward caste and less than fifty per cent of respondents belonged to general caste. A very little population of respondents belonged to scheduled tribe and scheduled caste.

3.1.9 Farm power:

Overall, less than two third of the male and female respondents had moderate farm power, followed by little less than one fourth of them having more farm power and only 14.03 per cent having less farm power.

3.1.10 Cattle possession:

More than three fourth of both the male and female respondents had 3 to 5 cattle, followed by 11.22 per cent of them having 1 to 2 cattle and 10.97 per cent having more than 5 cattle.

3.1.11 Mechanical power:

Overall more than seventy per cent of the male and female respondents had medium mechanical power, followed by 16.33 per cent having less mechanical power and 11.23 per cent having more mechanical power.

3.1.12 Irrigation facility:

Overall, more than forty per cent of the respondents had medium irrigation facilities, followed by less than one third having more irrigation facilities and more than one fourth having less irrigation facilities.

3.1.13 Implement Possession:

Overall, little more than forty per cent of the respondents possessed only one implement, followed by

more than the one fourth possessing two implements, little less than twenty per cent possessing three implements.

3.1.14 Material possession:

It was revealed that overall, little more than fifty per cent of male and female respondents had average material possession, followed by little more than one fourth having less material possession and more than one fifth of the respondents had more household material possession.

3.1.15 Family size:

About two third of the respondents belonged to small size family and one third of the respondents belonging to medium size family.

3.1.16 Type of family:

It was found that less than two third of the respondents belonged to joint family and remaining one third of them belonged to nuclear family.

3.1.17 Annual income:

Majority (80.10%) of the respondents both male and female had annual income upto Rs. 25000, followed by 13.26 per cent of the respondents having annual income between Rs. 25001 to 50000 and only six per cent of the respondents had more than Rs. 50000 annual income.

3.1.18 Social participation:

It was revealed that sixty per cent of the respondents had moderate social participation, followed by one fourth of the respondents having less social participation, and only 13.27 per cent of them having more social participation.

3.2 Risk Preference

3.2.1 Risk preference level:

It was found that little less than two third of the respondents had moderate risk preference, followed by one fifth of the respondents having high risk preference and 14.54 per cent of the respondents having low risk preference regarding adoption of new soil and water conservation technologies.

3.2.2 Risk preference of rural male farmers towards SWC activities:

The rural male farmers had high risk preference in the following positive items in the SWC activities:

- Adoption of new soil and water conservation technologies for production in degraded wasteland (2.87).
- Adoption SWC technologies in cultivable land at any cost for increasing production (2.78).

The male respondents had moderate risk preference in the rest of the positive and negative activities in adoption of SWC programme.

3.2.3 Risk preference of rural female farmers towards SWC activities:

The rural female farmers showed high risk preference in the following positive items in the soil and water conservation activities:

- Adoption of new soil and water conservation technologies for production in degraded wasteland (intensity index 2.93).
- Female farmers liked to adopt SWC technologies in cultivable land at any cost for increasing production (2.79).

The female respondents also had moderate risk preference in the rest of the positive and negative activities in adoption of SWC programme.

3.3 Knowledge

3.3.1 Knowledge level of rural male and female farmers regarding soil and water conservation technologies:

Majority (70.15%) of the respondents had moderate level of knowledge, followed by little less than one fifth of the respondents having low knowledge and 11.48 per cent of the respondents having high level of

knowledge regarding soil and water conservation technologies.

3.3.2 Knowledge of rural male and female farmers regarding different soil and water conservation technologies:

It was revealed that high majority (92.86%) of both the male and female respondents had knowledge of spread of materials on surface of land to protect from soil erosion. More than eighty per cent of the respondents having knowledge of that the trees are planted on the boundaries of crop fields. Less than two third of the respondents having knowledge of minimum ploughing to be done to create appropriate soil condition for seed germination. More than fifty per cent of the respondents having knowledge of that the cultivation of cereal crops is followed by pulse or leguminous crops, the animals can be allowed in grazing land after adequate growth of vegetation, one crop should not be grown repeatedly in cultivable land year after year and crops are grown across the slope of the agriculture field.

3.4 Attitude

3.4.1 Attitude levels towards participation in SWC programme

Less than three fourth of the male and female respondents had neutral attitude, followed by more than fifteen per cent having unfavourable attitude and more

than ten per cent of the respondents having favourable attitude.

3.4.2 Itemwise intensity indices according to the attitude of rural male farmers:

It was revealed that not a single positive items with high intensity index was found regarding the attitude of the male respondents towards soil and water conservation programme. Thus, non of the male respondent showed favourable attitude towards positive items in soil and water conservation programme and showed neutral attitude towards all the positive items. It indicates that the male farmers showed neutral attitude towards the SWC programme.

It was also revealed that not a single negative item with high intensity index was found regarding the attitude of the male respondents towards soil and water conservation programme. Thus, non of the male respondent showed favourable attitude towards negative items in soil and water conservation programme and showed neutral attitude towards all the negative items. It indicates that the male farmers showed neutral attitude towards SWC programme.

3.4.3 Itemwise intensity indices according to the attitude of rural female farmers:

It was revealed that not a single positive item with high intensity index was found regarding the attitude of the female respondents towards soil and water

conservation programme. Thus, non of the female respondent also showed favourable attitude towards positive items in soil and water conservation programme. It indicates that the female respondents showed neutral attitude towards these positive items. It means that the female respondents showed unfavourable attitude towards these items.

It was further reveals that not a single negative item with high intensity index was found regarding the attitude of the female respondents towards soil and water conservation programme. Thus, non of the female respondent showed favourable attitude towards negative items in soil and water conservation programme.

It indicates that the female respondents were neutral with these items and showed neutral attitude towards SWC programme.

3.5 Adoption

3.5.1 Distribution of respondents according to their levels of adoption of SWC technologies

Majority (79.59 %) of both the male and female respondents were medium adopters, followed by more than ten per cent of the respondents were low adopters and only 6.38 per cent were high adopters of soil and water conservation technologies.

3.5.2 Percentage distribution and intensity indices according to the adoption of SWC technologies by male farmers:

The male respondents had high adoption level in the summer ploughing practice (2.73). The male respondents showed moderate adoption level in the rest of the SWC practices and only showed low adoption level in the contour bunding (1.46) SWC practice.

3.5.3 Percentage distribution and intensity indices according to the adoption of different SWC technologies by rural female farmers:

The female respondents also showed high adoption level in the summer ploughing (2.69) and showed moderate adoption level in the rest of the SWC practices. The female respondents also showed low adoption level in the contour bunding (1.58) SWC practice.

3.6 OVERALL PEOPLE'S PARTICIPATION IN SOIL AND WATER CONSERVATION PROGRAMME

3.6.1 Distribution of respondents according to their overall people's participation levels in SWC programme:

The majority (84.69%) of the male and female respondents had moderate level of overall people's participation, followed by more than ten per cent having less overall people's participation and only 3.57 per

cent having more overall people's participation towards soil and water conservation programme.

3.7 PEOPLE'S PARTICIPATION IN PLANNING OF SOIL AND WATER CONSERVATION PROGRAMME

3.7.1 Distribution of respondents according to their participation levels in planning of SWC programme:

More than three fourth of the total respondents had moderate level of participation in planning, followed by more than ten per cent having less participation and less than ten per cent having more participation level in planning of soil and water conservation programme.

3.7.2 Activitywise intensity indices according to the male farmers' participation in programme planning:

The male respondents showed high participation in the following programme planning activities:

- Participating in planning meetings of SWC programme (2.70).
- Suggesting idea during planning of checkdam in their fields (2.69).

The male respondents showed moderate level of participation in planning stage of Antisar watershed SWC programme in the rest of the activities.

3.7.3 Activitywise intensity indices according to female farmers' participation in programme planning stage:

The female respondents showed high participation in the SWC activities that is suggesting idea during planning of checkdams in the watershed (2.67). The female respondents showed moderate level of participation in planning stage of Antisar watershed SWC programme in the rest of the activities.

3.8 PEOPLE'S PARTICIPATION IN IMPLEMENTATION OF SOIL AND WATER CONSERVATION PROGRAMME

3.8.1 Distribution of respondents according to their participation levels in implementation of SWC programme:

Overall, more than three fourth of the respondents had moderate level of participation in implementation, followed by nearly one fifth having less participation level and only 4.34 per cent having more participation level in implementation stage of soil and water conservation programme.

3.8.2 Activitywise intensity indices of the extent of male farmers' participation in programme implementation stage:

It was revealed that the male respondents showed high level of participation in the soil and water

conservation programme implementation activity of allowing Programme Implementing Agency to implement SWC programme works on their field (2.78). The male respondents showed moderate level of participation in the remaining activities during the soil and water conservation programme implementation stage.

3.8.3 Percentage distribution and intensity indices of the extent of female farmers' participation in programme implementation stage:

It was revealed that the female respondents showed high participation in the soil and water conservation programme implementation activity of allowing Programme Implementing Agency to implement SWC programme works on their field (2.92). The female respondents showed moderate level of participation in the rest of the activities of soil and water conservation programme implementation. It indicate that the female respondents were contributed moderate level of participation in the SWC programme implementation stage.

3.9 PEOPLE'S PARTICIPATION IN MAINTENANCE OF SOIL AND WATER CONSERVATION PROGRAMME

3.9.1. People's participation levels in maintenance of SWC programme:

It was found that little more than three fourth of the male and female respondents had moderate level of participation in maintenance of SWC programme and remaining less than one third respondents having less and

more participation levels in maintenance of soil and water conservation programme.

3.9.2 Male's participation in the SWC programme maintenance stage:

It was revealed that the male respondents had contributed high level of participation in the soil and water conservation programme maintenance activity of protecting forest plantation done in the watershed area from animals (2.62). The male respondents showed moderate level of participation in the rest of the activities of soil and water conservation programme maintenance. It indicate that the male respondents had contributed moderate participation in the SWC programme maintenance stage.

3.9.3 Female's participation in the SWC programme maintenance stage:

It was revealed that the female respondents showed high participation in the soil and water conservation programme maintenance activity of protected forest plantation done in the watershed area from animals (2.66). The female respondents showed moderate level of participation in the remaining activities of the soil and water conservation programme maintenance. It indicates that the female respondents had contributed moderate level of participation in the SWC programme maintenance.

3.10 RELATIONSHIP BETWEEN INDEPENDENT VARIABLES AND DEPENDENT VARIABLES:

3.10.1 Relationship between the overall male farmers' participation and the selected independent variables:

The study revealed that the variables socio-economic status, land holding, farm power, family size, social participation, risk preference, knowledge, attitude and adoption were positively and significantly correlated with the overall participation of male farmers in SWC programme. Whereas, the variables age, education and income were positively and non-significantly correlated with the overall participation of male farmers in SWC programme in Antisar watershed.

3.10.2 Relationship between the overall female farmers' participation and the selected independent variables:

It was find out that the variables socio-economic status, education, family size, social participation, risk preference, knowledge and attitude were positively and significantly correlated with the overall participation of female farmers in the SWC programme. It was also revealed that the income was negatively and significantly correlated with the overall participation of female farmers. Whereas, the variables land holding, farm power and adoption were positively and non-significantly correlated with the overall participation of female farmers. The variable age was found negatively

and non-significantly correlated with the overall participation of female farmers.

3.10.3 Relationship between the male farmers' participation in planning of Soil and Water Conservation programme and the selected independent variables:

The study revealed that the variables socio-economic status, land holding, farm power, social participation, risk preference, knowledge and attitude were positively and significantly correlated with the participation of male farmers in planning of SWC programme. Whereas, the variables age, family size income and adoption were positively and non-significantly correlated with the participation of male farmers in planning of SWC programme. The variable education was found negatively and non-significantly correlated with the participation of male farmers in planning stage.

3.10.4 Relationship between the female farmers' participation in planning of Soil and Water Conservation programme and the selected independent variables:

It was find out that the variables socio-economic status, social participation, knowledge and attitude were positively and significantly correlated with the participation of female farmers in the planning of SWC programme. It was also revealed that the income was negatively and significantly correlated with the participation of female farmers in planning. Whereas, the

variables education, farm power, family size, risk preference and adoption were positively and non-significantly correlated with the participation of female farmers in planning of SWC programme. The variables age and land holding were found negatively and non-significantly correlated with the participation of female farmers in planning of SWC programme.

3.10.5 Relationship between the male farmers' participation in implementation of SWC programme and the selected independent variables.

The study revealed that 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 land holding, family size, income, social participation and adoption were positively and non-significantly correlated with the participation of male farmers in implementation of SWC programme. The variables age and education were found negatively and non-significantly correlated with the participation of male farmers in the implementation stage.

3.10.6 Relationship between the female farmers' participation in implementation of SWC programme and the selected independent variables:

It was find out that 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 the implementation of SWC programme. It was also revealed that the variables age and income were negatively and significantly correlated with the participation of female farmers in implementation. Whereas, the variables land holding, farm power and adoption were positively and non-significantly correlated with the participation of female farmers in implementation of SWC programme.

3.10.7 Relationship between the male farmers' participation in maintenance of SWC programme and the selected independent variables:

The study revealed that the variables socio-economic status, land holding, farm power, family size, risk preference, knowledge, attitude and adoption were positively and significantly correlated with the participation of male farmers in maintenance of SWC programme. Whereas, the variables age, income and social participation were positively and non-significantly correlated with the participation of male farmers in maintenance of SWC programme. The variable education was found negatively and non-significantly correlated with

the participation of male farmers in the maintenance stage.

3.10.8 Relationship between the female farmers' participation in maintenance of SWC programme and the selected independent variables.

It was found out that the variables socio-economic status, land holding, education, family size, risk preference, knowledge, attitude and adoption were positively and significantly correlated with the participation of female farmers in the maintenance of SWC programme. Whereas, the variables farm power and social participation were positively and non-significantly correlated with the participation of female farmers in maintenance of SWC programme. It was also revealed that the variables age and income were negatively and non-significantly correlated with the participation of female farmers in the maintenance stage of SWC programme.

3.10.9 Relationship between the dependent variables of people's participation in SWC programme and the independent variable gender.

Point biserial correlation was used to compute correlation between continuous variables of people's participation in different stages and the two-categoried or dichotomous variable i.e. gender. It was revealed that gender was negatively and non-significantly correlated with overall and implementation stage of people's participation in soil and water conservation programme. Whereas, the Gender was found positively and non-

significantly correlated with people's participation in planning and maintenance stages of soil and water conservation programme.

It was revealed that the independent variable gender does not have significant correlation with different dependent variables of people's participation in SWC programme. Therefore, it may be concluded that there is no significant difference between the participation of male respondents and female respondents in overall extent of people's participation and in different stages of Antisar watershed development programme such as planning, implementation and maintenance. Thus, the female respondents are as equal to as male respondents and vise-versa.

3.11 CONSTRAINTS FACED BY RESPONDENTS

3.11.1 Constraints faced by the male respondents:

It was revealed that majority of the male respondents faced the constraints during Antisar watershed development programme were lack of finance, high cost involved in adoption of technology, shortage of labour in watershed, lack of knowledge about watershed management practices, inadequate transport facilities and lack of cooperation of people.

3.11.2 Constraints faced by the female respondents:

Similarly, the majority of the female respondents also faced the constraints during Antisar watershed

development programme were lack of finance, shortage of labour in watershed, high cost involved in adoption of technology, lack of knowledge about watershed management practices, lack of cooperation of people and inadequate transport facilities.