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RESEARCH ARTICLE

ATTITUDE TOWARDS WATERSHED MANAGEMENT PROGRAMS AND LEVEL OF PARTICIPATION: LIAISON ANALYSIS IN SOUTHERN ETHIOPIA

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ABSTRACT

In developing countries including Ethiopia, human needs for watershed resources are increasing from time to time. On the other hand the existing watershed resource goes down and unable to meet the demand of the urban as well as the rural communities. Due to this fact, Watershed development has been considered as one of the strategies to create a healthy environment and improve livelihood, and efforts have been made in different parts of the country Ethiopia. However, the effort aimed at improving rural livelihood through managing watershed resources chased failure to understand farmer's attitude and participation. Therefore this study tries to identify people's attitude, level of participation in watershed development activity and analyze the relationship in Karasodity watershed, Southern Ethiopia. Combinations of methods were used to achieve the stipulated objective. Different PRA tools/techniques were employed in addition to formal questionnaire survey. The attitude scale was administered on the sample farmers (N=313) who were asked to express their reaction in terms of their agreement or disagreement with each item developed and standardized by selecting any one of five response categories strongly agree, agree, undecided, disagree and strongly disagree. In the study watershed farmers', experts of different background from Agricultural and Rural Development Office, and watershed implementing committees were involved in the project management. With increasing funds allocated to watershed development, non government organization (i.e. Sefte-net) aggressively participated in implementing this program in the area, and demonstrated the importance of farmer's involvement in the success of watershed development. The present inspection reveals that on an average 84% of the respondents participated at the planning stage. A very high proportion of respondents contributed in the form of labour, followed by participation in the form of both labour and money. The study result also revealed that the majority of respondents (89%) had partial awareness where as a very low proportion (1.59%) is having complete level of awareness. Fair level awareness was observed for agroforestry, mixed cropping and intercropping. Thus, it may be concluded that majority of respondents are having positive attitude towards the watershed development programme. Establishing learning capacity in local communities may be particularly important to achieve sustainable participatory watershed management because of the importance of local institutions and collective action in the watershed environment. The research or learning process can be a way to united diverse stakeholders around common interests and goals.

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INTRODUCTION

Watershed is a hydrological unit that is considered to be efficient and appropriate for planning and implementation of various development programs. It is defined as an area of land that drains water, sediment and dissolved materials to a common outlet (Luca, 2004). Integrated nature of watersheds provides a strong rationale for using them as the basis for managing, restoring, and rehabilitating ecological systems.

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However, watershed resources in Ethiopia have suffered severe degradations in the last decades. According to German *et al.,* (2006) in the highland region watershed resource degradation is of increasing concern due to its role in aggravating poverty and the loss of environmental services to local and watershed downstream users. Natural vegetation destruction and soil erosion are the most pressing form of watershed degradation in Ethiopian and the country constitute one of the most degraded watersheds in Africa (El-Swaify and Hurni, 1996; Woldeamlak, 2003). The Governments of Ethiopia have established several policies mainly people centered project and has been practiced at different places and scales for many years in order to solve this problem. The idea was introduced in the

mid 1980s in order to better control land degradation, achieve household food security and sustain a variety of ecosystem functions (Bezuayehu and Leo, 2007). Consequently, the term participation has gained a lot of popularity particularly in reference to sustainable natural resource management. Development agencies, rural development offices and NGOs introduced concept of participation in watershed management projects and programmes at different parts of the country.

However, more often than not, watershed programmes result in success that is transient and within decade watershed resource degradation can again be seen. The lack of beneficiaries' participation was identified as a reason for failure of many development efforts. In addition, evaluation of those programmes revealed certain deficiencies and lacunae in their planning and implementation, like poor pre project preparation, lack of co-ordination among various stakeholders implementing the programme, weak monitoring and absence of cost sharing by the beneficiaries (DHN and Madurai, 2003).

The public participation today is demanding a greater role in decision making processes about the management of watershed resources. There are also several studies which highlighted the importance of participation (Irvin and Stansbury, 2004; Platt, 2006). In the other side attitude concepts has played a central role in understanding human thought and behavior. The relationship between attitudes and behavior has been the topic of considerable debate; the analysis revealed that attitudes significantly predict future behavior (Stephen, 1990). It has usually been assumed that a person's attitude toward an object can be used to predict his behavior with respect to the object (Fishbein and Ajzen, 1975).

Attitudes are generally viewed as one's relatively enduring affective cognitive and behavioral dispositions toward various aspects of the world including persons, events and aspects of the world including persons, subjects. Many studies have shown relationship between attitude and participation (Lise, 2000).

Hence, the understanding of attitudes is one of the central concerns in social life and is vital for bringing desired change in the behavior (Rishi, 2003). Social actions of people are directed by their attitudes. By knowing the attitudes, it may be possible to do something about the prediction and control of their behavior, which may be ultimately useful for the more successful implementation of watershed management program. Therefore, the study tries to identify people's attitude, level of participation in watershed development activity and analyze the relationship.

MATERIALS AND METHODS

Description of the study area

Karasodity watershed is located in Wonago destrict of Gedeo zone and largely drains on Abaya district, Borena zone (Fig. 1). Geographically, this watershed is located between 6°15'N to 6°26'N latitude and 38°10'E to 38°12'E longitude.

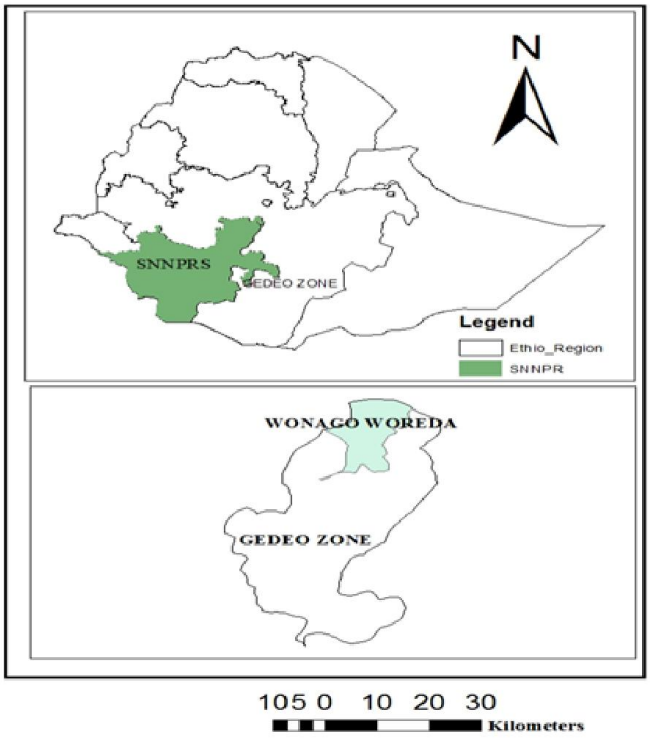

Figure 1. Map of the study area

Karasoditi watershed is inhabited mainly by Gedeo ethnic group. Gedeos in the upper part of the watershed are largely engaged in mixed type of cropping and mixed agriculture. While the low-lying parts, Guji people are agro-pastoralists. So this watershed is inhabited by two major ethnic groups, different economic activities and land uses which could have different implications on watershed resources.

The mean monthly temperature of this watershed ranges from 23.2^0c in July to 30.2^oc in January. Regarding rainfall, mean annual rainfall ranges from 800 to 1400 mm in the upper part of the watershed while it is 105.5 mm. The middle and lower part of the watershed is belonging to the dry sub-humid to the semiarid moisture regimes. The rain has bimodal pattern where in good years the first rainy season begins at March and continues up to June. The second season starts in September and extends up to November.

The altitude ranges from 1400 to 1980 m.a.s.l. The lower part of the watershed is composed of plain land and lowland area where livestock production is the main stay of the community. The upper and middle part of the watershed is characterized by rugged topography where by coffee (*Coffea arabica*), Enset (*Ensete ventricosum*), maize (*Zea mays*) and teff (*Eragrostis Spp.*) are major crops. Nitosol is the major soil class of this watershed. In the upper part the soil texture is mainly clay and relatively fertile and cultivated for agro forestry and annual crops.

Method of data collection

Combinations of methods were used to achieve the objective of the research.

PRA tools/techniques

Different PRA tools/techniques were employed to facilitate discussion, enhance understanding of important issues with watershed inhabitants/farmers and collect relevant qualitative data. Additionally interview with key-informants including community leaders, elder farmers, development agents and experts were used. Quantitative information was generated from households through structured interview.

I. Reconnaissance survey

Field visits of the study area were made to get the first impression on physical conditions of the study watershed. Concurrently, discussions with watershed management experts from Agricultural and Rural Development office (ARDO) were held to create awareness on the objectives of the study and exchange ideas concerning watershed management programe and people's participation. The PRA tool that was used for the study includes observation/ transects walk, focus group discussion and historical trend analysis.

II. Observations/transect walk

The field observations/transect walks were conducted to document all intervention measures in the watershed. It was also being done with the purpose of getting guiding information that can contribute while framing the questionnaire survey instruments.

III. Key informants interview

Key informants are defined as people who are most knowledgeable about watershed management and who have been lived continuously in the watershed for long period of time. Key informants were selected systematically with the help of local administration officers and development agents.

IV. Focused group discussion (FGD)

The interactions of different group of interests provide valuable information about the people's attitude and their level of participation in watershed management development activity. Hence FGD with concerned individuals from the ARDO, the local administrations, community representatives, and older community members were held to understand the people's attitude and participation in watershed management programme.

Questionnaire survey

To achieve the study objective 5% the total households were drawn from the total households in the study area. The household were selected randomly from the watershed for questionnaire by using simple random sampling (SRS) methods. To determine the adequate sample size, the equations described by (Cochran, 1977 cited in Belayneh, 2005) were employed.

$$n_0 = \frac{z^2 pq}{d^2} \quad \text{and} \quad n = \frac{n_0}{1+\frac{n_0-1}{N}}$$

Where;

$\mathbf{n_0}$ = is the desired sample size when the population is greater than 10,000

n = is number of sample size when population is less than 10,000

Z = is 95% confidence limit i.e. 1.96

p = is 0.1 (proportion of the population to be included in the sample i.e.10%)

q = is 1-0.1 i.e. (0.9)

N = is total number of population

d = is margin of error or degree of accuracy desired (0.05)

Development of attitude scale

A well structured attitude scale consists of a number of items that have been carefully edited and selected in accordance with certain criteria as the items in any psychological test. The first step in evolving attitude scale is to collect a large number of items, each expressing some opinion about the psychological object under the study. A large number of items were collected from literature, informal discussions with field staff of Wenago Destrict ARDO experts, NGO (Sefti-Net) officers in the study watershed, development agents of the district and informal interviews with the farmers of Karasodity watershed. Focus all through, in such interviews was to pick up items. From all these sources 80 items were listed, which had relevancy with varying degree to reflect the attitude. These items were not evaluated in the first instance. The items collected were examined and each item was carefully edited by following the criteria suggested by Edwards (1957). After rigorous culling, only 30 items were retained. Efforts were made to select an equal number of positively and negatively worded statements in the scale. Each statement comprised minimum possible words and these were checked for their easy comprehension.
The selected items were then subjected to analysis to determine their relevancy and subsequent screening of items for their inclusion in the final scale. Then necessary modifications were made. By this process, 19 statements were isolated in the first stage. Item analysis in the Likert's technique of attitude measurement, item analysis is an important step in the construction of valid and reliable scale. The purpose of item analysis is to select such items which can very well discriminate between two criterions. The 19 items were administered to a random sample of 50 farmers on a five point scale outside the study watershed. Scores assigned for the negative statements were; strongly disagree- 1, disagree -2, undecided -3 agree -4 and strongly agree - 5. For positive statements the scoring pattern was reversed. The total score of a respondent was computed by summating his scores for all the individual items.

For the final selection of items, the critical ratio of each statement was calculated. Critical ratio is a measure of the extent to which a given statement differentiates between the high and low groups of respondents (Edwards, 1957). As the items were administered to 50 farmers in the present study, a group of seven respondents with highest scores constituted the high group and the group of seven respondents with the lowest total scores formed the low group. The high and low groups provided the criterion groups to calculate the critical ratio of

each item. The critical ratio was calculated by using the following formula

$$t = \frac{\bar{X}_H - \bar{X}_L}{\Sigma (X_H - \bar{X}_H)^2 + \Sigma (X_L - \bar{X}_L)^2}$$

Where,
X_H: The mean of scores on a given statement for the high group
X_L: The mean of scores on a given statement for the low group
n: Number of respondents in each group

The thumb rule of rejecting items with 't' value less than 1.75 was followed (Edwards, 1957). As per the thumb rule selection of items to be retained in the final scale, apart from eliminating those with poor discriminating ability and questionable validity, was a matter of including those with highest discriminating values. Thus, the final attitude scale contained 14 items. The final attitude scale is given in Appendix II under schedule for data collection.

Standardization of the scale

The scale developed was further standardized by establishing its reliability and validity. Reliability of the scale Reliability is the ability of a test instrument to yield consistent results from one set of measures to another. A good instrument should evoke responses that are valid and yield nearly same results if administered twice to the same respondents (Goode and Hatt, 1952). According to Kerlinger (1964) reliability is the accuracy or precision of a measuring instrument. In the present study, split-half method was used for testing reliability. The scale was split into two halves on the basis of odd and even number of statements and administered to 50 respondents. Thus, the two sets of scores were obtained.

Validity of the scale

Validity of the scale was attained by establishing its content validity which is a form of validity by assumption (Guilford, 1954). The main criterion of content validity is how well the contents of the scale represent the subject matter which is important for the variable under the study. This was ensured in the initial stage of selection of dimensions and items for inclusion in the scale by exercising at most care to include all those aspects and items which are important to measure the attitude of farmers towards watershed development programme.

Administering the attitude scale

The final attitude scale was administered on the sample farmers (N=313) who were asked to express their reaction in terms of their agreement or disagreement with each item by selecting any one of five response categories; strongly agree, agree, undecided, disagree and strongly disagree with scores for the positive statements being 5, 4, 3, 2 and 1, respectively and the scoring pattern for negative statements was reversed. The total attitude score for each respondent was obtained by adding the weights of his responses made to the individual scale items. The farmers were categorized into less favorable, favorable and more favorable categories by considering mean and standard deviation.

a) Less favorable: < Mean – 0.425 SD
b) Favorable: Mean + 0.425 SD
c) More favorable: >Mean + 0.425 SD

Questionnaire survey instruments

A structured questionnaire was developed to verify and quantify the findings. The questionnaire were tested before implementation for its consistency, logical flow, coding and length, and amended. Enumerators who had completed secondary school studies, and understood and spoke the local language were recruited. Training on the content of the questionnaires, where, when and how to conduct the interviews with farmers, were given to these enumerators. Questioners that are found not to be clear to the local people and enumerators during training were tested and modified. Amendments were also incorporated into the questionnaire so as to make the idea easily comprehendible to the interviewees and enumerators.

Data collection

During data collection total area coverage (upstream and downstream of the watershed) approach were used in order to have a spatial representation of the areas. To gather qualitative and quantitative information face to face interviews using pre-tested and validated questionnaire were held with randomly selected households.

Data analysis method

The qualitative and quantitative data collected through informal interview, filed observation, structured interview and secondary data sources were checked, arranged, coded and entered into the computer and analyzed using the Statistical Package for Social Science (SPSS). Mean, percentage, frequency and other parameters were described. In addition, MS-Excel were used to generate tables and graphs.

RESULT AND DISCUSSION

Socio economic characteristics

Farmers' socio-economic setting affects the participation in different watershed development activities. The respondents in the present study were characterized into different social categories (Table 1). For the entire household agro-forestry was the principal occupation. The other income generation activities such as selling charcoal and fuel wood, petty trading, and wage and carpentering are supplementary. Most respondents had land holdings between 0.5- 1 ha.

The findings of the study also showed that the majority of the respondent were male (87%) and married (96.3%). The average family size of the study area was 5 members per household.

Table 1. Socioeconomic characteristics of the household

Socioeconomic characteristics	No	Percent
HHs type		
Male headed	264	84.35
Female headed	49	15.65
Age category		
19-34	197	62.93
35-49	79	25.24
>50	37	12.83
Family size		
1-2	22	7.03
4-6	253	80.83
>6	38	12.14
Occupation of interviewee		
Agro-forestry	274	87.54
Agro-forestry and other	39	12.46
HHs land size		
0.5- 1.0	234	74.76
1.1-2.5	73	23.32
2.6-4.0	6	1.9
> 4	0	0

Note: N=313; HH= household

Benefits of watershed programs

The study watershed was confronted with acute problems of land degradation mainly through soil erosion, and high levels of risk associated with deforestation. Technological interventions made so far through soil and water conservation greatly reduced most watersheds' degraded systems. In the study area watershed programs were largely aimed to conserve soil and water as a means of raising farm productivity. The respondents and the available evidences revealed that both these objectives were accomplished in the watershed programs. During FGD farmers in the study watershed emphasizes that soil loss was saved due to interventions in the watershed framework. Similarly, they also conformed an average reduction of surface runoff during pick rainfall time that might be used to augment both surface and groundwater reserves. These believed to have direct impacts on increasing cropping intensity. These benefits confirm that the watershed programs are a viable approach to overcome several externalities arising from the degradation of soil and water resources.

Among important function of watershed programs was to generate employment opportunities. This would have the positive impact of alleviating rural poverty and reducing income disparities among households. The mean additional annual employment generation in the watershed area on various activities and operations was 30-40 person days/ha. The generation of employment opportunities within these rural communities will invariably increase their purchasing power with a corresponding decline in rural poverty. Based on these observations, the watershed investments may be viewed as a poverty alleviation program in the study area.

The above evidence suggests that watershed programs successfully met two basic objectives of conserving soil and water resources and generating income through improving farm productivity and employment opportunity. These benefits have far reaching implications for farmers in the study watershed. However, the benefits often vary depending upon the attitude and participation of farmer's in the watershed.

Enabling conditions for farmer's participation in the study Watershed

Traditionally, watershed programs in many countries were supply-driven. Central and regional governments were responsible for the allocation of resources for watershed development and officials within responsible departments identify locations and decide on the various activities that would be implemented in the program. Often such approaches did not match the needs of stakeholders in the watershed. In the absence of farmer's participation, the potential benefits that could flow from watershed programs were not realized. Recognizing this, the concept of participatory integrated watershed development was adopted in the mid 1980s in Ethiopia. This approach had qualified success in most watersheds' in the country including the study watershed.

In the study watershed farmers', experts of different background from ARDO, and watershed implementing committees were involved in the project management. With increasing funds allocated to watershed development, non government organization (i.e. Sefte-net through employing poor households in the watershed) aggressively participated in implementing this program in the area, and demonstrated the importance of farmer's involvement in the success of watershed development. Most of these arrangements were varied across the watershed. In this respect the voluntary participation of people in the program effectively ensured the success and sustainability of watershed programs.

Nature and Extent of Participation

The survey result showed that all the activities of the watershed development were classified on the basis of their stages, i.e. planning stage and implementation stage. The nature and extent of participation of sample farmers in these activities were showed in Table 2. Respondents were classified as a participant if he/she had contributed in any of the watershed activities in terms of labour or finances or both.

Planning Stage

The present inspection reveals that on an average 84% of the respondents participated at the planning stage (Table 2). A very high proportion of respondents contributed in the form of labour, followed by participation in the form of both labour and money. The highest proportion of respondents participated in the participatory rural appraisal (PRA) which involved making of watershed resource map, problem identification, ranking of felt needs, and seasonal analysis. It was followed by capacity building (i.e. training in soil and water conservation, intercropping, manure and fertilizer). Participation was high for activities involving no financial contribution. Thus, a greater proportion of farmers participated by way of labour contribution. However, it can be argued that financial contribution is essential for ensuring long-run interests of the stakeholders and consequently, the sustainability of the programme. Contribution made by the poor respondents enables them to lay a claim to the sharing of benefits emanating from the common pool resources and creates a sense of equity and trust among the watershed inhabitants. The same result was reported by Palanisami *et al.*, (2002) in the study made in India.

Implementation Stage

The finding discloses the nature and level of participation at the implementation stage of the programme (Table 2). The implementation stage activities were grouped into two categories: (a) development of common land, and (b) development of private land. It can be observed that the participation was much higher (61%) in the development of common land than private land (35%). This is due to the fact that activities such as making of bunds, development of forest and grazing land and gully plugging undertaken on the common lands affected a large number of the respondents. The perceived benefits of the activities such as making bunds and gully plugging motivated the respondents to actively participate in common lands. Since the development of common land led to the benefits that were more democratic with respect to social class i.e. poor or wealthy, gender and age, it could also supposed to attract greater participation. In the case of development of private lands, activities such as treatment of drainage lines, tree/shrub planting and contour cultivation attracted high participation. The participation of respondents was found high in some selected activities of the watershed development.

Table 2. Household participation in different watershed institutions at the planning stage of watershed programme

Activity	Nature and level of participation							
	Financial only		Labour only		Both		Overall participation	
	No.	%	No.	%	No.	%	No.	%
Participatory rural appraisal (PRA)	0	00	263	84	0	00	263	84
Capacity building	0	00	298	95	3	0.96	301	96
Institution building	0	00	303	96.8	5	1.59	308	98.4
Average			288	91.9	2.67	0.85	290.67	92.8

NB: N=313

Monitoring and Evaluation Phase

The indicators of watershed development programme sustainability showed in Table 4, along with the extent of participatory monitoring and its evaluation. It can be seen that a large proportion of the respondents (98.4%) felt that the watershed will working well even if the ARDO and sefti-net withdraw. Surprisingly, 1.6% of the respondents were found to be uncertain, it indicates a scope of their inclusion in the decision-making process. It is often stated by the respondent that ARDOs are stronger in the participatory approaches, and social mobilization.

There is, however, a need to make farmers in the study watershed see beyond meeting the physical and financial targets and evolve a mechanism to assess the bio-physical and socio-economic impacts of programmes they implement. This will make them sensitive to inclusion of beneficiaries at all the stages of decision-making. The finding is supported by the study made by Turton and Farrington (1998) on livelihood improvement through watershed development.

Attitude of respondent on Integrated Watershed development activities

The study result (Table 3) revealed that the majority of respondents (89%) had partial awareness where as a very low proportion (1.59%) is having complete level of awareness. Thus, it can be concluded that only 8.95% of respondents had incomplete awareness regarding recommended watershed practices.

Table 3. Percentage distribution of respondents according to their awareness level with respect to recommended practices

No	Level of awareness (Score range)	HH No.	Percentage
1.	Incomplete (1-16)	28	8.95
2.	Partial (17-32)	280	89.46
3.	Complete (33-48)	5	1.59

Note: N=313

From Table 4 it is evident that a fair level awareness was observed for agroforestry, mixed cropping and intercropping with the mean score value 2.08, 2.05 and 2.01 respectively. Whereas, the low levels of awareness were observed for pasture management, gully control and water harvesting having respective mean score value as 1.43, 1.28 and 1.01. This study finding is in line with what has been reported by Singh (1993).

Table 4. Level of awareness of respondents regarding watershed development activities

No.	Watershed practices	Level of awareness			Mean value	Rank
		Complete (Score=3) No %	Partial (Score=2) No %	Incomplete (Score=1) No %		
1.	Agroforestry system	298 95.21	15 4.79	0 00	2.08	1
2.	Afforestation	284 90.73	26 8.31	3 0.96	1.87	5
3.	Mixed-cropping	131 41.85	178 56.87	4 1.28	2.05	2
4.	Drainage line treatment	84 26.84	164 52.4	65 20.76	1.85	6
5.	Contour cultivation	293 93.61	18 5.75	2 0.64	1.95	4
6.	Strip-cropping	120 38.34	181 57.83	12 3.83	1.78	7
7.	Inter-cropping	228 72.84	85 27.16	0 00	2.01	3
8.	Gully control	124 39.62	80 25.56	109 34.82	1.28	14
9.	Pasture management	15 4.8	55 17.57	243 77.63	1.43	13
10	Cover cropping	137 43.76	161 51.44	15 4.8	1.57	10
11	Crop rotation	211 67.41	82 26.2	20 6.39	1.65	9
12	Contour bunding	18 5.75	177 56.56	118 37.69	1.56	11
13	Conservation of wasteland	0 00	56 17.89	257 82.11	1.67	8
14	Water harvesting	2 0.64	39 12.46	272 86.9	1.01	15
15	Plantation of vegetative checks of runoff	16	114 36.42	183 58.47	1.46	12

Note: N=313

To measure the attitude of respondents towards watershed programme a scale containing 15 statements comprising 5 positive and 5 negative statements was used. Scores were categorized into three attitudinal categories namely more favorable, favorable and less favorable and the frequencies obtained are given in Table 5.

Table 5. Extent of household attitude towards watershed development activity

No	Category (Score range)	No	%
1.	Less favorable (Less than 176)	53	16.9
2.	Favorable (177- 290)	96	30.7
3.	More favorable (291 and above)	164	52.4

Note: N=313

Table 5 indicates that 52.4% had more favorable attitude and the respondents who co-opined the favorable attitude regarding watershed programme were 30.7%. Thus, it may be concluded that majority of respondents are having positive attitude towards the watershed development programme.

In order to identify the prioritized training needs of the respondent, 12 different training areas were observed. 3 point scale was used and scores were assigned as 3, 2 and 1 for more needed, needed and less needed respectively. On the basis of calculated mean score value for different training areas rank order was decided (Table 6).

Table 6. Respondents training needs

No	Training area	Training needs						Mean	Rank
		More value needed=3		Partial needed=2		Less needed-1			
		No.	%	No.	%	No.	%		
1.	Soil & water conservation	280	89.56	33	10.54	0	00	2.63	1
2.	Inter-cropping	4	1.28	131	1.85	178	56.87	1.64	12
3.	Cropping sequence	84	26.84	65	20.7	164	52.46	1.75	11
4.	Pasture management	293	3.61	18	5.75	2	0.64	1.90	8
5.	Agricultural planning according to land capability	120	38.34	181	57.83	12	3.83	1.95	7
6.	Water conservation tech.	228	72.84	85	27.16	0	00	2.56	2
7.	Agroforestry	124	39.62	80	25.56	109	34.82	1.78	10
8.	Manures & fertilizers	243	77.63	55	17.57	15	4.8	2.50	3
9.	Plant protection	137	43.76	161	51.44	15	4.8	1.85	9
10	Irrigation & water mgt.	211	67.41	82	26.2	20	6.39	2.10	6
11	Alternative land use	118	37.69	177	56.56	18	5.75	2.25	4
12	Fruit production	124	39.62	109	34.82	80	25.56	2.26	5

Note: N=313

From Table 6 it is clear that the areas of training needs which was highly demanded by the respondents were soil and water conservation, water conservation technique and manure and fertilizer ranked 1st, 2nd and 3rd respectively. Here it is necessary to recall that the awareness of the farmers about the practices related to the areas mentioned above, as reported in this study might be the reason for their demand in training needs in the respective area. It is otherwise also important to note that while imparting training to watershed beneficiaries these areas ought to be considered. Similar result was reported in the study made by Ulrade (1992).

Perceived problems of the respondent

It was evident from the Table 7 that more than 90% of the respondent expressed that a lack of resource like high value or multipurpose tree seedlings in the watershed is the major constraint. This was followed by lack of knowledge about the watershed development activities, lack of incentives from the implementing organization, uneven distribution of incentives, supply of poor quality materials and inputs, and week service from extension worker. On the other hand all the sampled households showed an interest in watershed development programme.

Table 7. Perceived problems of respondents in participation

No.	Problems	No.	%	Rank
1.	Lack of knowledge	291	92.97	2
2.	Uneven distribution of incentives	73	23.32	4
3.	Supply of poor quality materials	23	7.35	5
4.	Acceleration of work during some season of the year which lead to poor quality of work	11	3.51	6
5.	Lack of free time to participate in watershed activities	5	1.59	8
6.	Weak service from extension workers	7	2.24	7
7.	Lack of resources	306	97.76	1
8.	Lack of incentives from the implementing organization	138	44.09	3
9.	Lack of interest	0	00	11
10.	Only plane areas were considered in survey to carry out watershed activities	2	0.64	9

Note: N=313

CONCLUSION AND RECOMMENDATION

Today watershed development has become the main intervention for natural resource management and rural development. As the study watershed was confronted with acute problems of land degradation mainly through soil erosion, and high levels of risk associated with deforestation watershed programs were largely aimed to conserve soil and water as a means of raising farm productivity. In the study watershed the soil was saved and also the programme generates employment opportunity that would have the positive impact of alleviating rural poverty and reducing income disparities among households. Thus the watershed development programmes have produced desired results and there are differences in their impacts. Moreover, watershed development programmes not only protect and conserve the environment, but also contribute to livelihood security.

People's participation is increasingly being recognized as critical for success in watershed development and management. In the study watershed farmers', experts of different background from ARDO, and watershed implementing committees were involved in the project management.

Respondents were classified as a participant if he/she had contributed in any of the watershed activities in terms of labour or finances or both. On an average 84% of the respondents participated at the planning stagen and in the implementation stage the participation was much higher (61%) in the development of common land than private land (35%). Similarly 98.4% of the respondents felt that the watershed will work well even if the ARDO and sefti-net withdraw. Therefore, it can be concluded that giving users a role in managing their own watershed resources can lead to projects that are more efficient and effective.

Regarding recommended watershed practices 89% of respondents had partial awareness where as a very low proportion (1.59%) is having complete level of awareness. Fair level awareness was observed for agroforestry, mixed cropping and intercropping. Thus, it may be concluded that majority of respondents are having positive attitude towards the watershed development programme. Concerning training need soil and water conservation, water conservation technique and manure and fertilizer were highly demanded and ranked 1st, 2nd and 3rd respectively by the respondents. Thus we can conclude that the awareness of the farmers about watershed development programme might be the reason for their demand in training needs in the respective area.

Based on the finding of this study the following recommendations were forwarded. Hence, the watershed impact assessment should be accorded due importance in the future planning and development programmes. Watershed development activities have significant impact on groundwater recharge, access to groundwater and hence the expansion in irrigated area. Therefore, it is recommended that the development of these water-harvesting structures, wherever feasible. In addition to these public investments, private investments through construction of farm ponds may be encouraged as these structures help in a big way to harvest the available rainwater and hence groundwater recharge.

Watershed development activities have been found to alter crop pattern, increase crop yields and crop diversification and thereby provide enhanced employment and farm income. Therefore, the existing farming system combining agricultural crops, trees and livestock components with comparable profit should be strengthened. Establishing learning capacity in local communities may also be particularly important to achieving sustainable participatory watershed management because of the importance of local institutions and collective action in the watershed environment. The research or learning process can be a way to united diverse stakeholders around common interests and goals.

The use of participatory methods in watershed projects is growing, but there is still a ways to go to institutionalizing use of participatory methods or achieving user empowerment through research. There is a need for both workable methodologies and systematic evaluation of the. Generally, the study has revealed that institutional effectiveness is the key factor towards guaranteeing involvement of the farmers in watershed programmes.

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