

FARMERS' PARTICIPATIONS AND ATTITUDE TOWARDS SOIL CONSERVATION MEASURES - A CASE STUDY FROM UTTARANCHAL

B. L. Dhyani, Ram Babu¹, J. S. Samra² and Nirmal Kumar

Central Soil & Water Conservation Research &
Training Institute, Dehradun - 248 195

ABSTRACT

It is well known that farmers' cultivation practices are prime cause of erosion. At the same time land users are the most important target group for the implementation of soil and water conservation measures and their concern is decisive for the success of these programmes. The study was conducted at ORP Fakot (Garhwal Himalaya) to understand how the farmers respond to change in their soil, water, vegetation management practices after 12 years (1975-86) continuous demonstrations efforts of efficient land management technologies. Analysis of sample survey data from within and outside watershed conducted during 1999-2000 revealed that integrated watershed management programme had created an awareness among Fakot farmers to self sustainable land management system.

INTRODUCTION

Development is a dynamic process and sensitive to various stimuli e.g. demographic pressure, socio-economic circumstances, opportunities, policies and programmes. With extensive range of technologies available for resource conservation one might ponder why there persist problem of land degradation (Lal, 1982; Stonehouse and Protz, 1993). Watershed management approach is now a widely acknowledged technology for balanced development. But it has been observed that financial and legal incentives provided during implementation of watershed management programmes brought only about short-lived conservation and farmers reverted to their old practices after their withdrawal (ASCI, 1991, IN-RIMT, 1994). Thus, to continue the pace of development, watershed management activities should be owned by the farmers. This requires a change in the attitude of farming community about new dimensions of land husbandry. Therefore, a study was undertaken to assess the effect of watershed management programme at Fakot, Tehri Garhwal (Uttaranchal) on various attitudinal attributes of farmers affecting sustainable land utilization pattern in the watershed.

1. Rtd. Pr. Scientist & Head, Eco. & Project Planning Divn. CSWCRTI, Dehradun
2. Dy. Director General (NRM), ICAR, New Delhi.

MATERIALS AND METHODS

The study was conducted at Operational Research Project, Fakot, Tehri Garhwal (Uttaranchal) where watershed management programme was implemented by Central Soil and Water Conservation Research and Training Institute, Dehradun during 1975-86. Fakot is a 370 ha hilly watershed (elevation ranges between 650 to 2015 m above msl) with average slope of 72% and average annual rainfall of 1900 mm. Arable land was only about 80 ha out of which 69 ha was rainfed (Anonymous, 1978). Various soil and water conservation measures were demonstrated in the watershed during implementation stage (Dhyani *et al*, 1997).

To assess the effect of programme on farmer's attitude towards land husbandry two sets of farmers (one from within watershed and another from 10 km away from the watershed termed as outside watershed) were selected using simple random sampling technique. Data on various land management attitudinal attributes were collected from 40 and 25 farmers from within and outside watersheds respectively on a well-structured pre-tested schedule during 1999-2000. The data were analysed with the help of nonparametric test (X^2 - test).

RESULTS AND DISCUSSION

Goals of farming community

Level and pattern of resource use depended much on the goal of the owners. Farming community in the hills may have various goals, e.g., food, fodder, fuel, soil erosion and environment degradation which they would like to fulfil by the use of available farm resources. Each farmer had its own ranking with respect to the relative importance of these goals. The results of the study are presented in Table 1.

Table 1 Goals of farming community

Goals	Farm group	Ranking percentage of farmers			
		I	II	III	IV
Food	A	86	8	2	4
	B	90	8	2	-
Fodder	A	3	36	40	21
	B	6	82	8	6
Fuel	A	2	50	35	13
	B	4	66	22	8
Soil Conservation and environment protection	A	-	2	15	65
	B	-	-	2	42

A = within watershed group; B = outside watershed group.

It is evident from Table 1 that food requirement i.e. to produce food-grains from their fields to meet their family requirement was ranked as first priority (86% within and 90% of outside the watershed). It indicated that any developmental efforts in the hills should primarily be focussed on the enhancement of food production to ensure people's participation. Majority of farmers within watershed (50%) ranked fuel requirement as second priority while 82% of outside watershed farmers preferred fodder as their second priority. Third priority among their goals was provided to fodder production by 40% of the farmers within the treated watershed

while outside farmers preferred fuelwood requirement as priority number three. Environmental protection through soil conservation programme was generally a least priority. Relatively higher ranking was given to environmental pay off within adopted watershed (65%) as compared to non-adopted watershed (42%). In order to generate conservation ethics and environmental consciousness among the watershed community strong links of production with resource conservation need to be elaborated and discussed.

Land degradation

For this purpose, three questions viz. condition of farmers land, form of its realization and reasons thereof, were put to the farmers of both the groups for their ranking and results are presented in Fig. 1. Eighty six per cent of within watershed farmers rated their land condition as good while 51.5% of outside watershed farm group were of the opinion that the condition of their land was slightly degraded. The opinion about land condition differed significantly (X was 15.2). Another important point was noticed that all the farmers within watershed responded, while 30% farmers outside watershed did not respond and showed their ignorance. The second question related to this was how the farmers realized that the land degradation was taking place in their land in the form of decline in the productivity of land or loss of land. There was a significant difference ($X = 11.34$) in the opinion of two groups. About 74% farmers of within watershed group realized soil degradation through decline in the productivity of land while 82.4% farmers of outside the watershed realised it through loss of a piece of land. It indicated that watershed management programme carried out in the watershed created awareness about the land degradation in the farming community right at its initial stages while outside watershed farmers realized only at the terminal stage of deterioration process. Hence, the farmers were adopting soil and water conservation techniques in their day-to-day farming activities.

The opinion of two groups varied significantly at 5% probability ($X = 2.52$). Majority of outside watershed farmers (83%) felt that high degree of land slope was responsible for the soil erosion while 68% of within watershed felt that slope which were unmanaged gave excessive runoff was the major factor causing soil erosion. Thus, their perception and approach of arresting soil erosion also varied.

Prevention of soil erosion

Various questions including attitudinal variables were asked which reflected interest of farmers to take soil and water conservation works and the type of assistance required from the government. The farmers were asked whether they can take soil conservation works in their field by themselves. Majority of both the groups replied negatively, which indicated that both groups wanted government assistance for implementation of conservation activities in the area. But opinion of both groups differed significantly ($X^2 = 7.2$) with respect to the type of government assistance required by them. About 82.5% of within watershed farmers sought for technical assistance while 58.6% of outside watershed farmers demanded material assistance (Table 2). About 83.3% of within watershed farmers preferred government support in kind while 76% of outside watershed farmers liked support in cash only. It showed that within watershed farmers were very much convinced and satisfied with the watershed, management programme and wanted to make material investments. Sixty per cent farmers within and 80% outside watershed were of the opinion that more than 50% of the total cost should be shared by government for soil and water conservation works and their was no

significant difference between the two groups. Farmers within adopted watershed preferred assistance for major works e.g. terracing or soil and water conservation works on community land and disfavoured small investments in maintenance and other crop improvement programmes, whereas, majority of the outside watershed farmers demanded financial support for each activity of soil and water conservation works. It was thus imperative from the analysis that farmers of the adopted watershed gained confidence about potential benefits of improved crop production through resource conservation programmes. Both the groups were of view that credit facilities for soil and water conservation did not exist in the area. Credit facilities existed only for commercial crop and horticultural plantation on a limited scale. A strong need is felt to motivate the financial institutions to mobilize their resource for watershed activities in the area.

Table 2 Role of government in soil and water conservation programmes

Attribute	Group	Percentage of farmers		X ²
		Treated watershed	Outside watershed	
Can take SWC works	Without govt. assistance	15.0	2.5	0.5
	with govt. assistance	85.0	97.5	
Type of government assistance	Technical	82.5	41.4	7.2
	Technical and Material	17.5	58.6	
Form of assistance	Kind	83.3	24.0	15.1
	Cash	16.7	76.0	
Contribution of government (%)	More than 50	60.0	80.0	0.07
	Less than 50	40.0	20.0	
Availability of institutional credit for SWC works	Yes	10.0	2.5	0.04
	No	90.0	97.5	

Soil fertility management

Management of soil fertility through improved crop production technology, crop rotations and management of organic residue is essential to enhance productivity of land on sustained basis. The two groups differed significantly in their opinion about crop rotations ($X^2 = 10.41$). Within the adopted watershed majority of farmers (70%) believed in crop rotations while the corresponding figure for outside watershed group was only 20% cent. Further investigation revealed that within adopted watershed farmers having very small holding or total irrigated area were the only who did not follow rotational cropping, whereas, outside watershed group followed rotational cropping in *jhingora* and *mandua* cultivation only. There was a significant difference between two groups in the management of crop residue ($X^2 = 7.4$) Fig. 2. Within experimental watershed about 87% farmers incorporated the left over crop residue in their field while 91.5% farmers of outside watershed either allowed it to graze or burn the stubbles before sowing of the crop. This contrasting behaviour could partially be attributed to the fact

that grazing in the experimental watershed was completely eliminated and stall feeding was being practised.

Persistent demonstrational efforts and well perceived benefits from watershed management programme at ORP, Fakot have stimulated the farmers for adoption of improved land and water management technologies as an integral part of their farming activities even though soil conservation and environmental ethics could not be developed among the farmers to the extent as expected. Mobilization of institutional credit facilities for soil and water conservation would help to boost sustainable land management system in the hills.

ACKNOWLEDGEMENTS

Authors are thankful to the Director of the institute for guidance and Shri D. K. Tomar, Technical Officer for collection of data, Shri Roopak Tandan, Technical Officer for compilation and analysis of data and Mrs. Nisha Singh for typing the manuscript.

REFERENCES

- Administrative Staff College of India (1991). Soil Conservation Scheme : River valley projects, Ram Ganga (U. P.) and Sutluj (H. P.) Administrative Staff College of India, Hyderabad.
- Anonymous (1978). Report on Operational Research Project on Watershed Management, Fakot; Bhaintan Watershed - Tehri Garhwal (U. P.) CSWCRTI, Dehradun.
- Dhyani, B. L., Samra, J. S., Ram Babu and Katiyar, V. S. (1997). Socio-economic analysis as a participatory integrated watershed management in Garhwal Himalaya, Fakot Watershed, CSWCRTI, Dehradun.
- Indian Resource Information and Management Technologies (1994). Evaluatin study of Mg. 5f and Mb2P watersheds, Sahibi FPR Catchment Rajasthan, iN-RIMT Pvt. Ltd. Hyderabad pp. 127.
- Lal, R. (1982). Effective Conservation Farming System for the Humid Tropics' In Soil Erosion and Conservation in Tropics, American Society of Agronomy/Soil Science Society of America. Special publication 43 : Madison, Wisconsin, U. S. A.
- Stonehous, D. P. and Portz, R. (1993). Socio-economic perspective on making conservation practices acceptable. In topics in Applied Resource Management in the Tropics vd., Acceptance of Soil and Water Conservation Strategies and Technologies. Edited by E. Baum, P. Wolf and M. A. Zobisch DISTL - Germany.

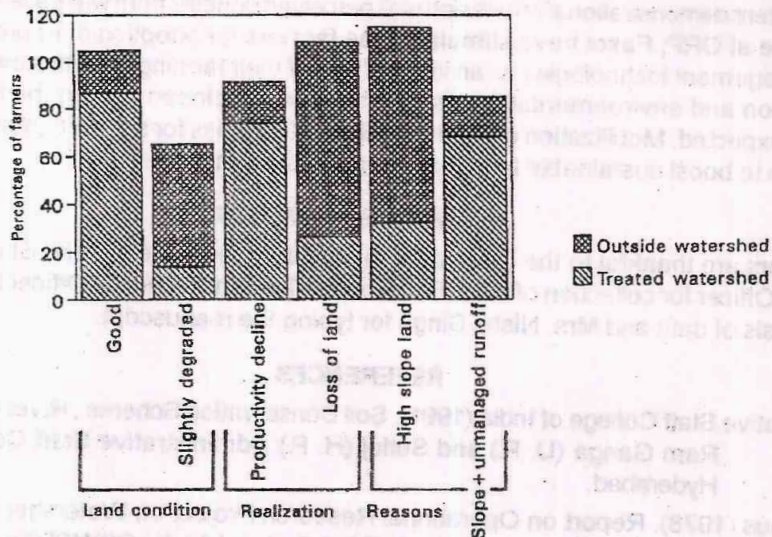


Fig. 1 - Opinion about land condition

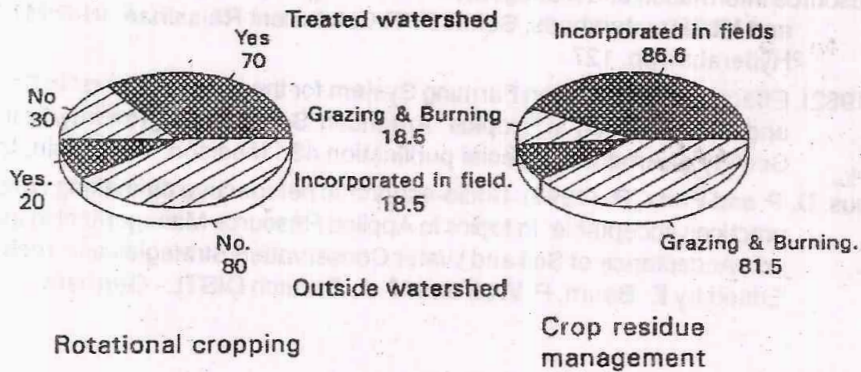


Fig.2-Soil fertility management practices