

Watershed Programme: Impact on Socio-agricultural and Socio-economic Spheres of the Farmers

K . Prabhakar*, K. Lavanya Latha and A. Papa Rao***

**Department of Anthropology, Sri Venkateswara University, Tirupati 517 502, Andhra Pradesh, India*

***Department of Business Administration, Yogi Vemana University, Kadapa, Andhra Pradesh, India*

KEYWORDS Watershed. Non-Government Organizations. Farmers. Social Aspects, Development

ABSTRACT Watershed programme is an integrated one, addressing the problems in rain-fed areas. It addresses the environmental and ecological problems like deforestation, over-utilization of water and most importantly it seeks to convert unsustainable agriculture to sustainable agriculture besides tackling unemployment and under-employment faced by the farmers as well as landless people. Of all the beneficiaries, the most benefited under watershed programme are the farmers of all types, like large, small and marginal farmers. Watershed brings them many favours like improvement in the ground water levels, restoration of eroded soils, crop rotation, improved agricultural technology, increased and improved animal husbandry, more green fodder to their milch and draught cattle etc., Hence, the present study focuses on the management of watersheds by the NGOs (Non-Government Organizations) claiming success and the impact on farmers in Prakasam district of Andhra Pradesh, India.

INTRODUCTION

Watershed is conceptualized as an area lying above a given drainage point. It may cover less than a hectare or thousands of hectares depending upon the point of reference. However, in simple terms "a watershed is the land area from which surface water drains to a single outlet."

Objectives of watershed are many like putting an end to environmental degradation, measures against soil erosion, rain water conservation, greening the country side, social forestry, improving the ground water level and agricultural development by initiating measures like bringing waste land under cultivation, providing water for irrigation, change in the cropping pattern and improvement in the crop yields etc., A successful watershed programme in any area will have its impact on the skill development of the people as well as on their social aspects besides economic impact in terms of increase in the incomes as well as on household expenditure.

NGOs have played a pioneering role in the field of rural development. Notwithstanding their limitations to undertake rural development programmes nation wide, they may contribute their mite by undertaking special projects in selected pockets by implementing them with an element of information and flexibility which is the distinctive feature of their work. Alternatively, they may concentrate on selected rural

development activities covering a wide geographical area. They may also stimulate and promote people's participation in governmental programmes like watershed and there by play a supportive role in the fields of rural development.

It may be mentioned here that the impact of watershed by the NGOs on the people may not be uniform particularly in a society like India which suffers with socio-economic disabilities. The impact may be differential and in this particular example, (Sample farmers) the impact of watershed may differ from social division to social division as well as category of the farmers like small, marginal and large. Hence, the present paper is an attempt to understand the impact of the watershed programme by the Non-Government Organizations on the agricultural, economic and social life of the farmers.

Review of the Literature

Various literatures are to be reviewed in this study. There are many studies about watershed programmes like the findings of Kallur's (1997) study that farmers are being cajoled by Sanghas and have succeeded partially in agriculture through improved agricultural practices. It is, therefore, that people's participation in adopting environment friendly techniques in farming with reference to three mini-watersheds is more or less a failure. Coming to the study conducted by Rajput and Verma (1997) which concluded that

the benefit-cost ratio is higher (1:2:51) in watershed development programme as compared to non-watershed development programme areas (1:1:83). The return on per rupee of investment was also higher in watershed development programme as compared to non-watershed development programme area.

Nalatwadmatha et al. (1997) reported that the cropping intensity of the watershed area has increased from 93.5 percent to 108.4 percent, while the productivity of different crops increased by 1.36 to 1.70 times. The watershed management programme not only increased the crop yield but also developed fodder resources in the area. And also Naidu et al. (1999) in their study found that yields of major crops like groundnut, sesamum, red gram, black gram, green gram, bajra, and ragi increased considerably during the period with adoption of better management practices, transfer of technology and high yielding variety seed.

Ratnakumari and Padmavathi (1999) conducted a study of the impact on watershed management of dry land farming in Kommaddi watershed. They concluded that the yield of groundnut as a mono crop has increased by 21.67 percent while as an intercrop with redgram rose by 17.39 percent. The yield of redgram as an intercrop with jowar and sunflower increased by 25 percent and 50 percent respectively. The productivity of jowar and sunflower increased by 26.87 percent and 12.50 percent respectively. Though there was an improvement in the crop yields in non-watershed area, the incremental yields were relatively more in watershed area than in non-watershed area.

In a study, Shiyani et al. (2002) examined the differential impact of watershed development in South Saurashtra region of Gujarat. Three watersheds managed by Gujarat State Land Development Corporation (GLDC) and one by NGO were studied. The study revealed that in GLDC watershed, rabi crops accounted for 22.59 and 14.60 percent of gross cropped area for beneficiaries and non-beneficiaries respectively. The corresponding figures for Agakhan Rural Support Programme (AKRSP) watershed were 34.59 and 23.59 percent for beneficiaries and non-beneficiaries respectively. It was also observed that the area occupied by summer crops was 9.01 percent of the gross cropped area (GCA) in case of beneficiaries of GLDC watersheds while no summer crop could be grown by the beneficiaries of AKRSP watershed as well as by all non-

beneficiaries. On the whole, it can be concluded that the rabi crops contributed as high as 28.4 percent of GCA in respect of beneficiaries compared to 19.1 percent of GCA in the case of non-beneficiaries. In addition, the beneficiaries were able to grow ground nut, bajra, jowar, and maize during summer season. The increased irrigation facilities created by the watershed development have been utilized by the beneficiaries for bringing more land under rabi and summer crops.

From above it is clear that there is hardly any study dealing with NGOs role in rural development through watershed developing programme especially in drought prone areas. The present study is a modest attempt in this direction in examining the role of NGOs in implementing watershed development programmes and to analyze the impact of these programmes on the beneficiaries with reference to their standard of living that is socio-agricultural and socio-economic spheres of the farmers.

METHODOLOGY

Area of the Study

Prakasam district in Andhra Pradesh was purposefully selected for this study. The district was selected because of two reasons. Firstly, in most of the areas in the district agriculture is rain-fed and the rain fall is scarce and erratic. Secondly, it is one of the few districts not only in Andhra Pradesh, India but also in the country where a number of watershed programmes have been launched in the rain-fed areas and a number of NGOs were entrusted with the initiation and management of watershed programmes.

Sample Selection

Between 1999 and 2003, 9 NGOs which claimed success in the watershed programme in 9 villages of three divisions of the district covering 500 acres of land in each village and further confirmed by the government agencies which entrusted the programme were selected for the study.

In each of the selected 9 villages, 16 percent of the farmers were selected to make in depth analysis of watershed impact on them. In the selection of the sample farmers, care was taken to select almost equal percentage of farmers from different social divisions in each of the 9 villages. The sample farmers were classified into four

social divisions namely (1). Forward castes (2). Backward castes (3). Scheduled castes and (4). Scheduled tribes. It means all the castes found in each of the 9 villages were classified under four social divisions for the sake of convenience of the analysis. Further, care was taken in the selection of sample farmers, to provide representation to the large farmers, small farmers and marginal farmers. The data for the study was collected from both primary and secondary sources. The primary data were collected through a structured schedule, informal interviews (using detailed checklists), key informant interviews and observation. Secondary data and information were collected from DPAP, DWMA project directors, Mandal Revenue Officers (MROs), Mandal Development Officers (MDOs), and selected NGOs of the Prakasam district. The data collected from the sample beneficiary farmers had been analyzed and presented in the form of simple and bivariate tables. Table 1 shows the scheme of sample selection.

Table 1: Selected of NGOs and villages sample farmers

Name of the NGOs	Name of the Mandal	Name of the village	Total farmer selected families	Sample families
<i>Ongole Division</i>				
HELP	Korisapadu	Pamedipadu	455	72
RDS	J.Pongalur	Chandalur	466	74
RASO	Ballikurava	Vemavaram	730	116
<i>Markapuram Division</i>				
CALL	Donakonda	Badapuram	139	22
SNIRD	Dornala	Bommala-puram	308	49
ASSIST	Markapur	Bhupati-palli	100	16
<i>Kandukur Division</i>				
SARDS	H.M.Padu	Pedagolla palli	264	42
RRS	Lingasamudram	Muttamvaripalem	376	60
PDES	V.V. palem	Polineni cheruvu	187	29
Total			3025	480

RESULTS

Social Divisions vs. Land Brought under Cultivation

Table 2 presents the distribution of the opinion of the respondents on the basis of social di-

visions and increase in the land under cultivation. Out of the 77 respondents who said that there was high increase of land under cultivation, highest percent (39.0 percent) come from backward castes and the lowest (16.9 percent) from scheduled tribes. Out of the 136 respondents who said that there was moderate increase, highest percent (30.9 percent) are from forward castes and again lowest percent (22.1 percent) are from scheduled tribes. Out of the 267 respondents who felt that there was only marginal increase, higher percent are from backward castes (36.7 percent) and lowest are from scheduled tribes (13.9 percent).

Table 2: Distribution of the respondents on the basis of social divisions and increase in the land under cultivation

Social composition	Increase of land			Total
	High increase	Moderate increase	Marginal increase	
Forward Castes	16 (13.3%) 20.8%	42 (35.0%) 30.9%	62 (51.7%) 23.2%	120 25.0%
Backward Castes	30 (18.8%) 39.0%	32 (20.0%) 23.5%	98 (61.3%) 36.7%	160 33.3%
Scheduled Castes	18 (15.0%) 23.4%	32 (26.7%) 23.5%	70 (58.3%) 26.2%	120 25.0%
Scheduled Tribes	13 (16.3%) 16.9%	30 (37.5%) 22.1%	37 (46.3%) 13.9%	80 16.7%
Total	77 (16.0%)	136 (28.3%)	267 (55.6%)	480

Crop-wise Land Utilization after the Watershed Programme

The important crops of the regions are chilli, tobacco, gingili, groundnut, red gram and black gram. Table 3 indicates that land utilization for cultivation of chilli increased from 229 to 303 ha after watershed programme followed by tobacco from 526 to 762 ha, gingili from 369 to 435ha, ground nut from 355 to 480ha, red gram 385 to 500ha, castor 310 to 380 and black gram 72 from 95 ha as per the study of Naidu et al. (1999).

Social Division vs. Increase in the Days of Employment

What is the opinion of the respondents from different social divisions on the question of ex-

tent of increase in the days of employment after the introduction of watershed? Distribution of opinion of the respondents is shown in the given table 4. Out of the 102 respondents who opined that there was high increase in the days of employment, 37.3 percent are from forward castes and least are found (7.8 percent) among the scheduled tribes farmers. Among 241 respondents who opined moderate increase, highest number (31.5 percent) are found among the backward castes farmers while least (18.3 percent) are found among the scheduled tribes. 35.0 percent of the total 137 sample who opined marginal increase belonged to backward castes and again least percentage (20.4 percent) among the scheduled tribes felt that there was only marginal increase.

Table 3: Crop-wise utilization of land before and after watershed programme

S. No.	Major crops	Before watershed programme (in ha)	After watershed programme (in ha)
1	Chilli	229	303
2	Tobacco	526	762
3	Gingili	369	435
4	Ground nut	355	480
5	Red gram	385	500
6	Black gram	72	95
7	Castor	310	380

Table 4: Distribution of the opinion of the respondents on the basis of social divisions and increase in the days of employment

Social composition	Level of Employment			Total
	High increase	Moderate increase	Marginal increase	
Forward Castes	38 (31.7%) 37.3%	57 (47.5%) 23.7%	25 (20.8%) 18.2%	120 25.0%
Backward Castes	36 (22.5%) 35.3%	76 (47.5%) 31.5%	48 (30.0%) 35.0%	160 33.3%
Scheduled Castes	20 (16.7%) 19.6%	64 (53.3%) 26.6%	36 (30.0%) 26.3%	120 25.0%
Scheduled Tribes	8 (10.0%) 7.8%	44 (55.0%) 18.3%	28 (35.0%) 20.4%	80 16.7%
Total	102 (21.3%)	241 (50.2%)	137 (28.5%)	480

Average Expenditure per Month

All the 480 respondents have expressed opin-

ion that there was increase in their annual incomes due to watershed programmes, though majority of them opined that the increase was only marginal. Along with the increase in incomes did their monthly expenditure also increase after watershed? Table 5 gives the comparative picture of average monthly expenditure pattern before and after the watershed programme. Except in the case of power/fuel which remained same during pre and post watershed programme, in the rest of the items the average monthly expenditure has increased post watershed programme. In the post watershed programme, education seems to have received great impetus, because the average monthly expenditure on education after the watershed has risen by 18 percent, post watershed has also seen 7 percent increase in medical expenditure.

Table 5: Average monthly household expenditure on various items before and after watershed programme (in Rupees)

S. No.	Expenditure pattern	Before watershed programme in Rs	After watershed programme in Rs	Percentage of increase in Rs
1	Food	682	728	4.6
2	Education	54	72	18
3	Power/ fuel	78	78	-
4	Religious function and festivals	75	78	3
5	Treating guests	31	35	4
6	Recreational activities	11	15	4
7	Clothing	25	30	5
8	Medicine	29	36	7
9	Travel	21	40	19

Impact on Other Aspects

An effort was made to find out the opinion of the respondents on the beneficial impact of watershed programme on other aspects like, migration, enhanced leadership qualities, empowerment of woman, increase in the enrollment in primary schools and increase in literacy rate etc., The information presented in the table 6 clearly shows that about 86.6 percent (1st rank) of the farmers observed that enrollment increased in the schools after watershed programme, 83.5 percent (2nd rank) of the farmers believe that there was decrease in the rate of migration and 73.9 percent (3rd rank) observed improved sanitation and

health. It is clear that majority of the respondents opined that there was qualitative and quantitative improvement after the introduction of watershed programme.

Table 6: Respondents opinion on other aspects after watershed programme

S. No.	Items	No. of respondents	Percentage	Rank
1	Increase in the Enrollment in schools	416	86.6	1
2	Decrease in the rate of migration	401	83.5	2
3	Improved sanitation and health	355	73.9	3
4	Increase in literacy rate	336	70.0	4
5	Enhanced empowerment of women	326	67.9	5
6	Increase in leadership qualities	324	67.5	6
7	Increase in the Visiting general hospitals and veterinary hospitals	322	67.0	7

*Multiple responses were allowed (*n=480)

Socio-political Impact

There is no doubt that the main impact of watershed development on the farmers is mainly economic due to the improvement in agriculture. But as seen from the activities of the NGOs consisting of entry point programmes and mobilization efforts through the programmes of awareness, the inevitability of impact on other socio-political activities of the farmers cannot be ruled out. Hence, an effort was made to understand the socio-political impact on the sample after watershed programme. In table 7, the analysis is based on the socio-political impact before and after watershed programmes on various aspects in the life of farmers. It is interesting to note that all the 480 respondents became members in one or the other of watershed committees constituted for the purpose. Better impact is noticed in all the 12 aspects recorded in the table after the watershed programme was launched but the extent of positive impact differs from aspect to aspect. For example, membership of respondents in SHGs increased from 17.1 percent to 87.9 percent. Like wise opening of bank accounts increased from 17.7 percent to 87.9 percent. There was also drastic increase in reading newspapers among the respondents and the increase noticed was 53.0 percent after the watershed programme.

Table 7: Socio-political impact before and after watershed programme

S. No.	Item	Before watershed programme	After watershed programme	Percentage of increase
1	Membership in political parties	164 (34.1%)	286 (59.5%)	25.4
2	Voting in state legislative election and local bodies	280 (58.3%)	413 (86.0%)	27.7
3	Contesting in the village panchayat election, ZPTC etc.,	18 (3.7%)	24 (5.0%)	1.3
4	Participation in grama sabhas	144 (30.0%)	303 (63.1%)	33.1
5	Membership in school education committees	40 (8.3%)	65 (13.5%)	5.2
6	Membership in SHGs	85 (17.1%)	422 (87.9%)	70.2
7	Membership in watershed committees	-	480 (100.0%)	100.0
8	Participation in awareness programmes like AIDS, sanitation etc.,	134 (27.9%)	279 (58.1%)	30.2
9	Interaction with government officials(mandal and district level)	144 (30.0%)	277 (57.7%)	27.7
10	Saving-opening of bank account	85 (17.7%)	422 (87.9%)	70.2
11	Ownership of radio, television etc.,	52 (10.8%)	130 (27.0%)	16.2
12	Readers of newspapers	82 (17.0%)	336 (70.0%)	53.0

Savings-Opening of Bank Account vs. Social Division

The NGOs as a part of their social mobilization to achieve peoples' participation encouraged and assisted the villagers to form Self Help Groups. Formation of SHGs necessarily involves financial dealings with both government agencies and banks and with the other credit institutions. As the new SHGs and membership in old SHGs increased, the members gained more and more experience in dealing with the credit institutions, like opening savings bank accounts, depositing and drawing money, taking credit etc. To what extent respondents' dealings with credit institutions increased during post watershed programme when compared to the pre watershed programme. Social division-wise information on

this aspect is shown in the table 8. From pre watershed to post watershed there was 70.2 percent increase in opening the bank accounts among the respondents. Backward castes respondents stand first with 24.9 percent increase and respondents from scheduled tribes stand last 9.4 percent increase.

Table 8: Saving–opening of bank account before and after watershed programme

S. No.	Social composition	Saving–opening of bank account		Percentage of increase
		Before watershed programme	After watershed programme	
1	Forward Castes	30 (6.2%)	112 (23.4%)	17.2
2	Backward Castes	20 (4.2%)	140 (29.1%)	24.9
3	Scheduled Castes	20 (4.2%)	110 (22.9%)	18.7
4	Scheduled Tribes	15 (3.1%)	60 (12.5%)	9.4
Total		85 (17.7%)	422 (87.9%)	70.2

DISCUSSIONS

On the whole, the sample NGOs studied, must be commended that all the 480 respondents did agree that there was positive impact of watershed programme in one or the other aspect of their life, particularly in the spheres of their agriculture and economy. But the impact is differential ranging from high to moderate and marginal. Seen social division-wise (caste), the differential impact is seen. In certain aspects forward castes fared better and in certain other aspects backward castes and scheduled castes fared better. Example is land brought under cultivation after the introduction of watershed programmes. Out of the total 480 respondents, 267 (55.6 percent) reported only marginal increase, followed by 28.3 percent moderate increase and 16 percent high increase as per study of Nalatwadmatha et al. (1997), Kallur (1997) and Rajput and Verma (1997). Seen caste wise, backward caste stand first with 18.8 percent claiming high increase followed respondents from scheduled tribes with 16.3 percent. Even within the total respondents claiming high increase, backward castes stand first with 39.0 respondents reporting high increase.

Again take for instance, increase in the days of employment. Slightly more than half of the total respondents (50.2 percent) reported moderate increase followed by 28.5 percent marginal increase and 21.3 percent high increase. Seen

caste wise and from the total high increase category, forward caste respondents stand first with 31.7 percent and 37.3 percent respectively. Least increase in both categories is reported from the respondents of scheduled tribes.

Positive impact of watershed in another aspect like decrease in migration, increase in leadership qualities etc., in the opinion of the respondents is substantial. Opinion on seven aspects (Table 7) ranged from 67 percent in visiting hospitals to 86.2 percent in the case of increase in enrollment in schools.

CONCLUSION

Finally, watershed impact on socio-political aspects of the respondents is examined, two factors merge. Firstly, the impact is much less in terms of respondents and secondly, in majority of the aspects, percentage from backward caste is more and least among the respondents from scheduled tribes when compared to other social divisions (castes).

It leads to the conclusion that all the 480 respondents did agree that there was a positive impact of watershed programme by the NGOs in one or the other aspect of their life, particularly in the spheres of their agriculture, social and economy.

RECOMMENDATIONS

Keeping in view the findings and conclusions of the study, the following recommendations are given:

1. The importance of watershed development should be recognized by all the development experts. Watershed programme is an integrated one addressing the problems in rain fed areas. It addresses the environmental and ecological problems like afforestation, water conservation and most importantly, it is supposed to achieve sustainable agriculture besides providing increased employment to the farmers as well as to the labourers.
2. In an overall analysis, NGOs played an important role in development of rural areas through watershed programmes. So the government should encourage the more and more NGOs to participate in watershed programmes for rural development.

REFERENCES

- Annual Report 2007-08. Prakasam District: District Watershed Management Agency.
- Kallur MS 1997. Role of People's Participation in Adopting Environment Friendly Techniques in Farming-A case study of Mine Watersheds of Wadigera Kalaamandargi and Limbu- Mono Tanda of Gulbarga University, Gulbarga. *Indian Journal of Agricultural Economics*, 52(3): 556.
- Naidu MR, Swamy KRL, Raju DVN, Padma Raju A 1999. Economic Impact of Watershed Management in Naravagadda Area of Vishakhapatnam District (A.P), *National Seminar on Watershed Management for Sustainable Development*, Department of Economics, S.V. University, Tirupathi.
- Nalatwadmatha SK, Rama Mohan Rao MS, Padmaiah M 1997. Jalodarsi Model Watershed Development Programme in Bellary District of Karnataka- A Diagnostic Evaluation. *Journal of Rural Development*, 16(2): 313-328.
- Rajput AM, Verma AR 1997. Impact of Integrated Watershed Development Programme in Indore District of Madhya Pradesh, *Indian Journal of Agricultural Economics*, 52(3): 537-539.
- Ratnakumari Padmavathi 1999. Impact of Watershed Management on Dry land Farming, *National Seminar on Watershed Management for Sustainable Development*. Department of Economics, S.V. University, Tirupathi.
- Shiyani RL Kakadia BH Tarpara VD 2002. Socio-economic Impact of Watershed Development in South Saurashtra Region of Gujarat, *Journal of Rural Development*, 21(3): 411.