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WATERSHED IMPACT ON AGRO-PRODUCTION AND LIVE STOCK SYSTEMS

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ABSTRACT

Household biomass production and processing are integral part of livelihood support systems in rain fed areas. Apart from his farm earnings the farmer leans on dairy, livestock, poultry, Piggery, household gardens, kitchen gardens, wages, common property resources for not only revenue supplementation but also for nutrient supplementation. The study was organized to know the impact of watershed on raising Agro production systems and livestock. Results shown that there was much percentage difference due to prior and after implementation of watershed activities in all the six villages surveyed with regard to cultivation of Agriculture, Horticulture, Kitchen gardens, Fodder development, Agro-forestry and also live stock possessions like dairy, poultry, sheep, goat etc.

Keywords: watershed, Agro production systems.

INTRODUCTION

The watershed approach aimed at augmentation and stabilization of production and productivity, minimizing ecological degradation, reduction in regional disparity, opening up of greater opportunities for employment of rural poor in the rain fed areas. A similar approach has been adopted for developing the more resource areas- drought prone, desert and waste land-and to provide sustainable means of livelihoods to the rural poor in these areas.

A watershed often referred as synonym to catchment in the hydrological divide separation one drainage basin from other. It is also defined as topographically delineated area that is drained by a stream system and is characterizes by a common outlet through which excess over land flow collected within the watershed is drained out [1]. Thus the water in the form of runoff which otherwise drains out as excess water can be efficiently managed by stopping it at any suitable location in the watershed. Depending of the scale, drainage basins, catchments or sub-catchments are the fundamental units for the management of land and water resources [2]. Soil and water are the most important natural resources within our eco system and watersheds have been identified as planning units for administrative purpose to conserve these precious resources [3,4]. The concept of management recognizes inter relationship among land use, soil and water and linkage between uplands and downstream areas.

As the holdings become smaller and smaller, small scale farmers depend on wage generating activities and also rely more on household production systems. The emphasis of watershed development to these systems also and proper planning is to be done to upgrade the existing systems, expand the activities and support them through subsidies or assistance. Some aspects are more activities in rural areas and they may change from region to region. Household biomass production and processing are integral part of livelihood support systems in rain fed areas. Apart from his farm earnings the farmer leans on dairy, livestock, poultry, Piggery, household gardens, kitchen gardens, wages, common property resources for not only revenue supplementation but also for nutrient supplementation.

MATERIALS AND METHODS

The present study was carried out to know the impact of watershed on Household production systems. Six villages from 3 Mandals in Prakasam District were selected for study. The selection was made like that to have two villages from each mandal. Thus-from Darsi Mandal-Ganeswarapuram and East Venkatapuram and from Mundlamur Mandal- Vempadu, Pasupugallu and from Kurichedu Mandal-Nancharapuram, Avvulamandha

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were selected. In all these villages watershed activities were there from 1995 to 2000 (Five years).

A total of 1869 families were surveyed from all the six villages to see impact of watershed on household production systems. A total of households 97, 374, 284, 597, 165, 352 from Ganeswarapuram East Venkatapuram, Vempadu, Pasupugallu, Nancharapuram, Avvulamandha respectively were surveyed for data collection.

A pre tested schedule was used to collect various details of the families pertaining to socio-economic status, agriculture, Horticulture, fodder crops, Agro forestry, livestock, self help groups, economic opportunities etc., The data was collected from each and every household of all the six villages and assessment was followed by field visits to collect detailed information about particular practices.

The data collected was tabulated and analyzed statistically. Percentages were calculated and differences were recorded to see the difference in standard of living of the families prior and after implementation of watershed, which indicates the impact of watershed in several respects.

RESULTS AND DISCUSSION

It is apparently seen from the table that in all the villages cultivation of agriculture has been improved due to watershed activities compared to earlier.

Mishra et al [5] reported that due to watershed activities there was improvement in increase in Agricultural production, employment value, farm forestry, vegetable gardens, and Socio- economic status of the people.

Agriculture, Horticulture and Agroforestry activities were observed before watershed. Kitchen garden and fodder development was observed only after watershed management. Results were shown in the following tables.

It is obvious from the table that with regard to Horticulture also there was much improvement due to impact of watershed. It is reported that 16.5% families in East Venkatapuram have adopted Horticulture, followed by the next high value 9.9% families at Vempadu. At Ganeswarapuram the difference is very less i.e., only 1.1%, as they didn't have much interest in Horticultural crops. Most of them have confined to Agriculture.

It is clearly shown from the table that there were no kitchen gardens prior to watershed activities, which was due to scarcity of the water. But after watershed activities there was greater change due to increased irrigation facilities as well as supply of seed under part of watershed activities.

According to report from watershed management plan, Chitradurga, Karnataka there was improvement in Agriculture, Afforestation and grassland development, increase in cultivation of horticulture especially tomato, brinjal, bhendi, chillies, onions, papaya, areca nut, coconut, betel vine.etc.

It is evidencially seen from the table that Fodder grasses were grown enormously due to watershed activities. But this change was not so prior to watershed activities.

Development and management of fodder or grasslands on watershed basis involve a package of practices based on ecological principles and scientific practices. Such package includes closure of the area from biotic influences, removal unwanted and obnoxious vegetation, techniques for moister conservation, upgrading of herbage quality and yield through high yielding varieties and nutrient rich grasses, legumes and fodder trees forming a multi-tier system, proper grazing management practices, conservation and carryover of forage for lean periods and arrangements for distribution or availability among the watershed farmers in times of droughts and fodder scarcity.

It is clearly observed from the tables that contrast to above cultivations this agro forestry activities have been reduced due to watershed activities, which was due to increased irrigation facilities that led to agricultural cultivations. Prior to watershed activities most of the farmers have confined to agro-forestry due to scarcity of water.

Singh et al [6] Stressed about the increase in vegetation for optimal watershed management to increase the vegetation.

With regard to dairy development, it is viewed from the table that there is much improvement in dairy development. This was due to increased rising of fodder grasses which was further due to increased irrigation facilities owing to watershed activities. Livestock production plays an important role in the management and utilization of arid and semi arid lands [7].

Poultry rearing is also increased due to watershed activities as there was provision of revolving fund to carry out such activities.

This activity is also shown positive result due to watershed activities as there was provision of loan facilities as well as revolving fund under this. Earlier to watershed activities there was no adoption of sheep rearing.

It is seen from the table that like sheep as mentioned above goat rearing is also existed due to the same reasons. In a case study by John Butter worth et.al [8] it was reported that Ramalingaiah is a shepherd in Tumkur, Karnataka. In 1990 his mother Ningamma bought one lamb for Rs.45/-. From this he developed animals. The herd now has 50 animals. And from these he is gaining income by selling lambs to run his family.

Livestock have been an integral part of farming systems and livelihoods of households especially in rainfed areas throughout the world.

Impact of watershed in all the villages (N=1869 households)

It is to record from the table that majority of the families that is 66.8% have adopted agricultural cultivation followed by fodder development (72.8%), then kitchen gardens at 52.7% and horticulture at 9.6%. But in contrast to above there was reduction in the raising in the agro forestry. This was due to increased irrigation facilities, the waste lands which were embedded with sarivi, subabulu have been converted to agricultural lands under watersheds.

It is to note down from the table that there was

improvement in the livestock also due to watershed activities. First occupies dairy at the rate of 69.9% followed by sheep rearing at 12.8%, poultry at 3.4% and lastly goat rearing at 0.4%. This was happened by virtue of watershed activities which led to rising of fodder grasses and finally led to increase in income level of the families also.

The operational research project at Fakot, Bhainton watershed, Uttar Pradesh [9] was undertaken to see its impact. The results revealed that Horticulture or Animal husbandry could contribute relatively greater income than mere crop production. The operational research project at Fakot, (Bhainton watershed) was undertaken to see its impact. The results revealed that Horticulture or Animal husbandry could contribute relatively greater income than mere crop production.

Sai Bhaskar Reddy [10] reported that farmers from Annavaram village in Mehabub Nagar District have shown great change in livelihood activities due to watershed. There was increase in Bio-mass which has resulted in increased livestock numbers. Now farmers are also able to cultivate vegetables and paddy and are able to graze their livestock locally due to increased fodder availability.

Hanumantha Rao [11] reviewed some of the studies and found increases in crop yields, availability of fodder, employment, milk production and reduction in migration.

Water and soil are two most important natural resources for our survival. Their rapid depletion obviously is of great concern for mankind. To arrest their degradation, technical knowledge, integration of various sciences, understanding of Socio-Economic aspects and peoples' participation are of utmost importance. The rural poor who live in watershed areas draw their survival biomass needs of fuel and fodder from wastelands and adjoining forest areas. Such households exercise tremendous impact on degeneration of the green cover. Unless their life sustaining biomass needs are provided by strategically planned interventions, their development in rural areas will not be sustainable. As a welfare state the Govt. of India and state Governments accord the highest priority to poverty alleviation in rural areas. The 25 years' perspective plan prepared by the planning commission also indicated poverty reduction as one of the major objectives of watershed development programme. It was suggested that the financial requirements for watershed development programme should be worked out on per family basis rather than the current practice of working out the budget on per unit area (hectare) basis.

Uncontrolled, unplanned, unscientific land use and human activities lead to deterioration of watersheds which in turn results in low productivity of food, fuel, forage, fibre and fruits, erosion and denudation, and poor health of people and cattle. Thus rational utilization of land and water resources for optimum production with minimum hazard to natural resources is of paramount importance. This can be made possible only by utilizing the c0llective wisdom of experts from various disciplines.

The study indicated that after installation of watershed there was improvement in all the villages regarding adoption of agricultural cultivation, which accounts to 66.8%, horticulture 9.6%, kitchen Gardens 52.7%, Fodder development 72.8%. Contrary to all this agro forestry have negative impact which was due to increased irrigation facilities which further led to increased adoption of agricultural cultivation and horticultural cultivations. When fodder development is considered there was increment in raising fodder grasses due to increased possessions of livestock.

In particular to livestock activities, there was improvement with regard to dairy, poultry, sheep rearing and goat rearing. But earlier to watershed activities livestock activities were very less due to scarcity of water.

Table 1. Impact on Agriculture

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	14	14.4	65	67	52.6
East Venkatapuram	28	7.5	208	55.6	48.1
Vempadu	20	7.0	217	76.4	69.4
Pasupugallu	45	7.5	410	68.7	61.2
Nanchara Puram	10	6.1	124	75.2	69.1
Avvulamanda	12	3.4	266	75.6	72.2

Table 2. Impact on Horticulture

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	2	2.1	12	3.2	1.1
East Venkatapuram	4	1.1	66	17.6	16.5
Vempadu	4	1.4	32	11.3	9.9
Pasupugallu	3	0.5	49	8.2	7.7
Nanchara Puram	1	0.6	12	7.3	6.7
Avvulamanda	2	0.6	26	7.4	6.8

Table 3. Impact on Kitchen Gardens

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	-	-	60	61	61
East Venkatapuram	-	-	125	33.4	33.4
Vempadu	-	-	175	61.6	61.6
Pasupugallu	-	-	245	41	41
Nanchara Puram	-	-	140	70	70
Avvulamanda	-	-	240	60	60

Table 4. Impact on fodder development

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	-	-	65	67	67.0
East Venkatapuram	-	-	280	74.9	74.9
Vempadu	-	-	210	73.9	73.9
Pasupugallu	-	-	400	67.0	67.0
Nanchara Puram	-	-	106	64.2	64.2
Avvulamanda	-	-	299	84.9	84.9

Table 5. Impact on Agro forestry

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	24	24.7	6	6.2	18.5
East Venkatapuram	35	9.4	6	1.6	7.8
Vempadu	25	8.8	8	2.8	6.0
Pasupugallu	60	10.5	14	2.3	8.2
Nanchara Puram	23	13.9	8	4.8	9.1
Avvulamanda	26	7.4	9	2.6	4.8

Table 6. Impact of Dairy

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	14	14.4	80	82.5	68.1
East Venkatapuram	10	2.7	320	85.6	82.9
Vempadu	68	23.9	180	63.4	39.5
Pasupugallu	42	7.0	430	72	65.0
Nanchara Puram	10	6.1	152	92.1	86.1
Avvulamanda	21	6	308	87.5	86.5

Table 7. Impact on poultry

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	6	6.2	8	8.2	2.0
East Venkatapuram	18	4.8	20	5.3	0.5
Vempadu	24	8.5	39	13.7	5.2
Pasupugallu	19	3.2	33	5.5	2.3
Nanchara Puram	18	10.9	31	18.8	7.9
Avvulamanda	13	3.7	29	8.2	4.5

Table 8. Impact on sheep rearing

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	-	-	2	2.1	2.1
East Venkatapuram	-	-	5	1.3	1.3

Vempadu	-	-	3	1.1	1.1
Pasupugallu	-	-	6	1.0	1.0
Nanchara Puram	-	-	3	1.8	1.8
Avvulamanda	-	-	5	1.4	1.4

Table 9. Impact on goat rearing

Name of village	Before Watershed activities		After Watershed activities		% difference
	No.	%	No.	%	
Ganeswara Puram	-	-	1	1.0	1.0
East Venkatapuram	-	-	1	0.3	0.3
Vempadu	-	-	2	0.7	0.7
Pasupugallu	-	-	2	0.3	0.3
Nanchara Puram	-	-	1	0.6	0.6
Avvulamanda	-	-	1	0.3	0.3

Table 10. Agricultural activities: (N = 1869)

Name of Activity	Before Watershed activities		After Watershed activities	
	No.	%	No.	%
Agriculture	129	6.9	1380	73.8
Horticulture	16	0.9	197	10.5
Kitchen Gardens	-	-	985	52.7
Fodder Development	-	-	1360	72.8
Agro Forestry	183	9.8	51	2.7

Table 11. Live Stock Activities (N = 1869)

Name of Activity	Before Watershed activities		After Watershed activities	
	No.	%	No.	%
Dairy	165	8.8	1470	78.7
Poultry	98	5.2	160	8.6
Sheep	-	-	24	12.8
Goat	-	-	8	0.4

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