

EFFECTIVENESS OF SOIL AND MOISTURE CONSERVATION ACTIVITIES ON FARMING PRACTICES AND USE OF FARM IMPLEMENTS

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ABSTRACT

Soil, water, vegetation, nutrients and energy are the basic natural resources needed for agricultural production. Due to ever-increasing population pressure, these natural resources are shrinking very fast. Since agricultural development is not possible on deteriorating natural base, thus, there is a need to lay emphasis on conservation and judicious utilization of these resources through adoption of sustainable management practices. The Integrated Watershed Development Programme (IWMP) is a key to sustainable production of food, fodder, fuel wood and meaningfully addresses the social, economical and cultural status of the rural community. Recognizing the importance of watershed development programme in the rain fed area, a large number of studies assessed the impact of watershed development over a period of time. It is undoubtedly expected that due to watershed intervention, awareness and economical condition of the farmers might be improvised. Which can lead to change in their farming practices and farm machineries too. This study was undertaken to check impact of soil and moisture conservation activities on farming practices and use of farm implements in Surat Districts of South Gujarat.

Key words: Watershed, Farm implements, Seed Treatment, Value addition

INTRODUCTION:

Successful implementation of the watershed programme is realized in the fact that it brings more land under cultivation, improve the quality of the land thereby the productivity. All the positive impacts of IWMP are expected to culminate in improved package of practices in farming profession, adoption of latest technologies, and up gradation in the use of farm implements as well as positive change in marketing and post-harvest technologies. People are able to get some regular income perhaps some additional income which leads to additional expenditure to uplift their source of income.

OBJECTIVE OF THE STUDY:

To study the impact of soil and moisture conservation activities on farming practices and use of farm implements due to watershed development works and subsequent impacts on rural livelihood.

RESEARCH METHODOLOGY:

In order to study the objectives of the study, ex-post-facto research design was selected, for that a well-structured interview schedule was prepared. There are 34 watersheds implemented in 3 batches of IWMP Phase I, in the Surat District of South Gujarat, out of which 6 watersheds selected and studied for this research. The interview schedule consisted of specific questions pertaining to soil and moisture conservation activities and its impact on various parameters was operated among total 150 core activity beneficiaries (25 from each watershed) i.e. farm land owners of the selected micro-watersheds. The respondents were selected by simple random method from the list derived from Watershed Development Team members and Village Watershed committees (VWC) and Watershed User Association (WUA).

RESULTS AND DISCUSSION:

The farmer respondents were asked about the farming practices and usage of farm implements before the project and any change after the project, responses for the same recorded and presented in **Table 1** given below:

TABLE 1: IMPACT OF SOIL AND MOISTURE CONSERVATION ACTIVITIES ON FARMING PRACTICES AND USE OF FARM IMPLEMENTS

Particulars	Farming Utilities	Pre IWMP		Post IWMP		Change
		Count	Table N %	Count	Table N %	%
Use of Seeds	Use of Traditional/local seeds	143	95.33	4	2.67	-92.67
	Use of Hybrid seeds	21	14.00	148	98.67	84.67
	Use of B.T.Seeds	1	0.67	7	4.67	4.00
	Other	0	0.00	2	1.33	1.33
Seed Treatment	Soaking in Water	119	79.33	6	4.00	-75.33
	Treatment with Fungicide/Pesticide	30	20.00	149	99.33	79.33
Sowing Method	With Traditional implements	140	93.33	4	2.67	-90.67
	With Improved implements	6	4.00	144	96.00	92.00
Ploughing Method	Deep ploughing in Summer	74	49.33	143	95.33	46.00
	Ploughing across the slope	2	1.33	75	50.00	48.67
	Planking after plowing	1	0.67	115	76.67	76.00
Use of Fertilizers	Use of compost	37	24.67	72	48.00	23.33
	Use of Chemical fertilizer	128	85.33	149	99.33	14.00
	Use of Cow dung	61	40.67	122	81.33	40.67
	Use of wormy compost	0	0.00	23	15.33	15.33
	Use of fertilizer following scientific recommendation	1	0.67	111	74.00	73.33
Control of Disease Pest	Through Natural and Traditional process	27	18.00	5	3.33	-14.67
	Through Chemical Pesticide/Insecticides	118	78.67	19	12.67	-66.00
	Through Both (Natural and Chemical)	5	3.33	126	84.00	80.67
	Through Bio-control	0	0.00	14	9.33	9.33
Mulching	Use of Dry leaves/ weed	4	2.67	9	6.00	3.33
	Use of Plastic Mulching	0	0.00	5	3.33	3.33
Farm Implements	Improved Seed drill	53	35.33	148	98.67	63.33
	Improved Plough	17	11.33	139	92.67	81.33
	Threshers	13	8.67	61	40.67	32.00
	Plant detacher clamp	21	14.00	105	70.00	56.00
	Harvester	1	0.67	9	6.00	5.33
	Tractor	2	1.33	45	30.00	28.67
Marketing Method	Selling directly from field to traders	139	92.67	13	8.67	-84.00
	selling through Co-operative Society	31	20.67	91	60.67	40.00
	Selling at APMC	0	0.00	98	65.33	65.33
	Selling by Own to customers	7	4.67	20	13.33	8.67
Value Addition Practices	Cleaning	22	14.67	133	88.67	74.00
	Grading	3	2.00	84	56.00	54.00
	Packaging	1	0.67	2	1.33	0.67
	Storage/ Cooling	0	0.00	1	0.67	0.67

Source: Field Data 2017-18

The data presented in Table 1 indicate the change in adoption of 'package of practices' and 'usage of farm implements', before and after the project implementation. In following paragraphs activity wise detail of the above parameters is presented.

1. Use of Seeds:

Before the implementation of the project, majority (95.30 per cent) of the farmer respondents made use of traditional/locale seeds in their farming. Very few (hardly 14.00 per cent) utilized hybrid seeds at that time. After the completion of the project, with the improvement in soil and moisture condition and increase in awareness about scientific crop production, nearly Cent per cent (98.67 per cent) of respondents adopted Hybrid varieties of crop in their fields. Cotton growers also adopted new improved BT seeds on their farm.

2. Seed Treatment:

Seed treatment is most important practice to avoid the seed born diseases as well as for better and healthy germination. Before the project intervention, majority of the farmer respondents (79.30 per cent) practice to soak the seeds in water. Very few (20.00 per cent) utilized proper fungicide treatments before plantation. After the project implementation almost all the respondents were practicing seed treatment with scientific recommendation to those varieties of seeds in which if it is necessary.

3. Sowing Method:

After the completion of the project more than ninety per cent deduction (90.67 per cent) was observed in usage of traditional implements in sowing the crop. Only 2.67 per cent of farmer respondents remained left to use traditional implements to sow their fields.

4. Ploughing Method:

Deep ploughing in summer season is utmost important operation to destroy the harbored insects and pests and check them to be continued in next season. It is also useful to prevent the formation of hardpan and facilitating percolation of rain-water and deep penetration of roots. Before the project, half of the respondents were practicing deep ploughing. Ploughing across the slope and planking followed by plowing are also useful for soil and moisture conservation in semi-arid and arid region, however these practices was limited up to one or two counts. Due to trainings and exposure visits as well as increase in extension activities by various approaches through Government initiatives, more than ninety-five per cent of the respondents use to practice deep ploughing in summer during study period. After the project more than half of the farmers cultivated their field across the slope or contour. More than three-fourth of the respondents (76.67 per cent) practiced to plank their fields after ploughing.

5. Use of Fertilizers:

Before the project intervention majority of the farmer respondents (85.33 per cent) utilized chemical fertilizers' application for their crop followed by, 40.67 per cent used cow dung and 24.67 per cent applied compost in their fields. Some of them incorporated two and more fertilizers or applied solely. Almost all of them failed to follow scientific recommendation for the application of fertilizers.

After the IWMP, combined use of organic manures and chemical fertilizers has increased. Nearly Cent per cent of the farmer respondents applied chemical fertilizers where and when necessary. Use of cow dung also increased and adopted by 81.33 per cent farmers, followed by 48.00 per cent practiced composting in their field. Wormy-compost was a new emerging fertilizer in the study area and 15.33 per cent respondents had already incorporated it in their farming practices. It was also noticed that sizable majority (74.00 per cent) of the farmers were following scientific recommendation issued by various extension agencies in the application of fertilizers for better harvesting from their fields.

6. Control of Disease Pest:

Before the watershed intervention majority of the farmer respondents (78.67 per cent) utilized chemical pesticide/insecticides for pest and disease control, whilst 18.00 per cent of the respondents followed natural and traditional techniques to save their crops. At that time very few farmers practiced both the process simultaneously.

After the implementation of the project, overwhelming majority of the respondents (84.00 per cent) opted natural and chemical control both, for effective eradication of disease and pest. This might be possible due to various awareness campaigns by Government, NGOs and Corporate sectors about the side effects of chemical measures on human health as well as environmental degradation. Due to strong extension work for 'Integrated pest and Disease Management (IPM)' had reduced the absolute use of hazardous chemical and replaced it with mixture of physical-chemical-biological control for pest and disease management. Nearly Ten per cent of the respondents also adopted Bio-control on their farm.

7. Mulching:

To reduce the potential loss of irrigated water mulching is necessary in the dry region. Thus this practice is useful to produce 'more crop per drop of water'. Yet, very few farmer respondents come forth to adopt it. Before watershed intervention only four respondents used dry leaves/ weed to cover/mulch their land for reduction of soil-moisture loss through sunlight. After the watershed programme nearly ten per cent of the respondents were practicing mulching on their fields. Of the total 14 such respondents, nine mulched through dry leaves/weed and five had practiced mulching by using plastic sheet.

8. Farm Implements:

Due to rainfed agriculture and marginalized holdings of land, very least numbers of farmers could adopt modern farm implements before watershed intervention. At that time only 35.33 per cent respondents practiced improved seed drill for sowing, 11.33 per cent use improved plough, 8.67 per cent utilize thresher, and hardly 14.00 per cent utilize plant detacher clamps. Use of heavy machines like harvester and tractor was a dream for them.

Watershed project implementation had changed the above scenario by introducing modern and mechanized farming techniques to facilitate crop production. It was just like miracle, nearly Cent per cent farm sown with improved seed drill after the project. Sizable number of farm respondents (92.67 per cent) adopted improved plough, more than two-fifth of them (40.67 per cent) using thresher, tremendous number of farmers (70.00 per cent) had their own plant detacher clamps, while 30.00 per cent of the farmers utilizing tractor and 6.00 per cent respondents made use of harvester in their fields. Thus, watershed activities brought forward the farming practices more convenient and fast.

9. Marketing Method:

The biggest challenge of small and marginal farmers in arid and semiarid region is lack of remunerative price to meet for their crop yields. Before watershed project majority of the farmer respondents (92.67 per cent) use to sell their commodities to the traders directly from their fields. This was due to marginalized holding of land and lack of microfinance facilities to the farmers, led them to sell their produce as such. Only one-fifth of the respondents utilized co-operative framework for the sale of their produce, whilst nearly five per cent of them adopted direct selling to ultimate users.

After watershed intervention 65.33 per cent farmers approached Agricultural Produce Marketing Committee (APMC) for the selling of their produce. Use of other co-operative societies was also more than sixty per cent. The process of selling to traders directly at door-step was reduced up to 84.00 per cent, whereas direct selling to customers increased.

10. Value Addition Practices:

Before watershed project due to lack of marketing infrastructure, almost farmers sold their produces without applying any value addition practices. Nearly fifteen per cent use to clean their produce before sell, while grading and packaging was practiced by negligible farmers. After the watershed treatment, 88.67 per cent farmers use to clean their produce before sell. Grading was adopted by 56.00 per cent farmers to derive remunerative prices for their produce. Still there is vast scope in packaging and storage/cooling practices in the study area.

It can be seen from the above information that, watershed intervention had positive impact on adoption of new improved package of practices and usage of farm implements in project area. Majority of the farmers in watershed area adopted hybrid and improved seeds, scientific seed treatments, improved sowing methods, ploughing and planking as per recommendation, usage of organic and inorganic fertilizers as prescribed in scientific cultivation, use of integrated pest management, mulching and proper farm implements. They also adopted different value addition practices and changed their marketing methods for betterment of life.

CONCLUSION:

Near about 90.00 per cent of the farmer respondents replaced the traditional package of practices to modern tools and techniques in crop production. Most of them adopted hybrid and high yielding certified seed, did seed treatment before sowing, used improved seed sowing instruments, deep ploughing in summer, farming across contour, use of cow dung, organic and inorganic fertilizer as per scientific recommendation, use of mulching materials, farm mechanization tools as well as changed marketing pattern. Some of them have also adopted post-harvest technologies for value addition of farm produces.

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