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Perception and constraints in adoption of soil and water conservation practices among the Sujala Watershed Project beneficiaries

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Abstract: The study was conducted in Sujala watershed project implemented in Haveri and Dharwad districts of Karnataka state during 2012-13. Sample consisting of 80 beneficiaries of project area and 80 non-beneficiaries were personally interviewed through structured interview schedule. The results revealed that high perception about the usefulness and appropriateness was noticed with more number of beneficiaries (56.25%) as compared to non-beneficiaries (40.00%). The usefulness of nala bund, contour bund and contour strip was highly perceived by beneficiaries (97.50, 85.00 and 77.50%, respectively) than non-beneficiaries (81.25, 58.75 and 61.25%, respectively). Similarly, appropriateness of constructing check dam, nala bund and dugout was highly perceived by beneficiaries (91.25, 85.00 and 82.50%, respectively) as compared to non-beneficiaries (42.50, 58.75, and 57.50%, respectively). Non-availability of suitable implements was expressed by 63.75 per cent non-beneficiaries and 48.75 per cent beneficiaries. Similarly, lack of technical guidance and training was observed with more of non-beneficiaries (58.75 and 56.25%, respectively) as compared to beneficiaries (35.00 and 31.25%, respectively).

Keywords: Constraints, Perception, Soil and water conservation, Sujala Watershed Project

Introduction

Conservation, up gradation and utilization of land and water on scientific principles is essential for the sustainability of rainfed agriculture. As rainfed agriculture in India contributes about 44 per cent of the total food production and supports 40 per cent of the population, development of rainfed agriculture is gaining importance and holds great prospect for contributing sustainability to produce food production. Similarly, exploring the full potential of rainfed agriculture in Karnataka state (65%) to meet the food, fodder and fuel requirement of the state population is the only alternative. In India, watershed development programme is being taken up under various programmes launched by the Government of India.

Of the various schemes of watershed project World Bank assisted Sujala watershed project is a unique programme as it is implemented by the communities through participatory management. In Karnataka this project was designed and implemented by the watershed development department during 2001-2009 in five districts of Karnataka *viz.,* Dharwad, Haveri, Chitradurga, Kolar and Tumkur, covering about 0.5 million ha of land in 77 sub watersheds benefited about four lakh families in 1270 villages across five districts.

Underlying the importance of Sujala watershed programme the present study was designed with the overall objectives of measuring the perception and constraints in adoption of soil and water conservation practices among beneficiaries in comparison with non-beneficiaries in purposively selected Dharwad and Haveri districts of northern Karnataka.

Material and methods

An Ex-post-facto research was conducted during 2012-13 in the Sujala watershed project implemented in Haveri and Dharwad districts of Karnataka state. The sujala watershed project in these districts was implemented during the period 2001 to 2007 with the objective of bringing changes in the socioeconomic condition of the farmers. Based on maximum area covered, two sub watersheds in each district were selected for the study. Further, two villages from each watershed were purposively selected based on maximum area and maximum number of respondents covered under the watershed. Thus, eight villages from four watersheds implemented in Haveri and Dharwad districts were selected for the study. From these selected villages, 10 beneficiaries in the project area and 10 non-beneficiaries in the non-project area each from the villages were selected randomly to constitute 160 samples for the study.

A teacher made test to measure the perception of beneficiaries about soil and water conservation practices was developed based on the suggestions of Anastasi (1961). Totally 14 items were considered to measure the perception about usefulness and appropriateness of soil and water conservation practices. The responses of the respondents against each aspect was recorded as "more useful', "useful' and "not useful' about usefulness of demonstrated soil and water conservation practices. Similarly, appropriateness of soil and water conservation practices under "more appropriate", "appropriate", and "not appropriate". These responses were assigned the scores 3, 2, and 1, respectively. Finally, the mean perception score about the usefulness and appropriateness of soil and water conservation practices was calculated. The constraints faced in adoption of soil and water conservation practices technology was measured under technical and non-technical items.

Results and discussion

The results presented in Table 1 highlights that perception about usefulness of nala bund, contour bund, contour strip and water ways, vegetative bund and boulder bunds recorded high mean scores with beneficiaries (2.97, 2.85, 2.73, 2.65 and 2.55 mean scores, respectively) as compared to non-beneficiaries (2.81, 2.48, 2.53, 2.30 and 2.33 mean scores, respectively). The

Table 1. Perception of usefulness of soil and water conservation practices (n=160)

Perception statements	Beneficiaries (n_1=80)			Non-Beneficiaries (n_2=80)			Mean score	
	More Useful	Useful	Not Useful	More Useful	Useful	Not Useful	Beneficiaries	Non-beneficiaries
Usefulness of soil and water conservation practices								
Constructing nala bund helps to increase underground water	78 (97.50)	02 (2.50)	00 (00.00)	65 (81.25)	15 (18.75)	00 (00.00)	2.97	2.81
Contour bund helps to drain out surplus rainwater	68 (85.00)	12 (15.00)	00 (00.00)	47 (58.75)	25 (31.25)	08 (10.00)	2.85	2.48
Contour bund, contour strip, and water ways are useful in low rain fall areas	62 (77.50)	15 (18.75)	03 (3.75)	49 (61.25)	25 (31.25)	06 (7.50)	2.73	2.53
Vegetative bunds helps to decrease velocity of rainwater coming from ridges(72.50)	58 (20.00)	16 (7.50)	06 (43.75)	35 (42.50)	34 (13.75)	11	2.65	2.30
Contour strip helps to increase moisture and infiltration rate	57 (71.25)	13 (16.25)	10 (12.50)	48 (60.00)	19 (23.75)	13 (16.25)	2.58	2.43
Small sunken ponds helps to check rain water in gullies	55 (68.75)	20 (25.00)	05 (1.25)	37 (46.25)	31 (38.75)	12 (15.00)	2.62	2.31
Waterways helps for safe disposal of excess rainwater	53 (66.25)	17 (21.25)	10 (12.50)	34 (42.50)	38 (47.50)	08 (10.00)	2.53	2.32
Boulder bunds are useful in sand mixed and shallow soil	52 (65.00)	20 (25.00)	08 (10.00)	39 (48.75)	29 (36.25)	12 (15.00)	2.55	2.33
Staggered contour trenches are useful in undue soil slope	37 (46.25)	30 (37.50)	13 (16.25)	21 (26.25)	28 (35.00)	31 (38.75)	2.30	2.25
Appropriates of soil and water conservation practices								
Cementery masonry works is ideal for check dam, vented dam, and nala bund structures	73 (91.25)	07 (8.75)	00 (00.00)	34 (42.50)	21 (26.25)	25 (31.25)	2.90	2.11
Check dam, vented dam, and nala bund are practiced in lower reaches	68 (85.00)	08 (10.00)	04 (5.00)	47 (58.75)	23 (28.75)	10 (12.50)	2.80	2.46
Farm pond and dugout are the important water harvesting structures	66 (82.50)	14 (17.50)	00 (00.00)	46 (57.50)	22 (27.50)	12 (15.00)	2.82	2.42
Dugout is ideal in the direction of diversion channel and flat land	48 (60.00)	23 (28.75)	10 (12.50)	38 (47.50)	23 (28.75)	19 (23.75)	2.50	2.23
Ideal catchment area of rubble check is 8-15 ha	35 (43.75)	38 (47.50)	07 (8.75)	19 (23.75)	21 (26.25)	40 (50.00)	2.35	1.73

Figures in parentheses indicates the percentages

analysis of perception about appropriateness of soil and water conservation practices reveals that appropriateness of cementary masonry works for constructing check dam, vented dam and nala bund in lower reaches, farm pond and dugout as water harvesting structures, appropriateness of check dam, vented dam and nala bund in lower reaches, and the direction of dugout was highly perceived by beneficiaries (2.90, 2.82, 2.80 and 2.35 mean scores, respectively) as compared to non-beneficiaries (2.11, 2.42, 2.46 and 1.73 mean scores, respectively).

The overall distribution of farmers according to perception of soil and water conservation practices as shown in Table 2 brings to light that high perception was noticed with more number of beneficiaries (56.25%) as compared to non-beneficiaries (40.00%). But, in low perception category 25.00 per cent non-beneficiaries and 16.25 per cent beneficiaries were noticed. This indicates that beneficiaries possess favorable perception about the usefulness and appropriateness of soil and water conservation practices. This might be due to increased awareness and opportunity to experience soil and water conservation practices by the beneficiaries of Sujala watershed programme. Also higher perception amongst beneficiaries might be due to experiences of soil and water conservation practices demonstrated during implementation of Sujala watershed project and possession of favorable socio-economic and entrepreneurial characteristics. Besides the opportunity of coming in contact with extension personnel might have benefited the beneficiaries in greater perception of soil and water conservation practices. Similarly, the varied level of perception about different soil and water conservation structures were also reported in the research studies of Lapar *et al.* (1999), Chandra Charan *et al.* (2007), Mansur *et al.* (2007), Ravi Shankar *et al. (*2007) and Vinod Gupta *et al.* (2009).

It is evident from the data presented in Table 3 that non-availability of suitable implements was perceived as major constraint among non-beneficiaries (63.75%), as compared to beneficiaries (48.75%). Lack of technical guidelines and lack of

Table 2. Distribution of respondent according to perception of soil and water conservation practices (n=160)

Category	Beneficiaries (n_1=80)		Non-Beneficiaries (n_2=80)	
	Frequency	Per cent	Frequency	Per cent
Low perception	13	16.25	20	25.00
Medium perception	22	27.50	28	35.00
High perception	45	56.25	32	40.00
Mean	2.55			
S.D.	0.22			

Table 3. Constraints in adoption of soil and water conservation practices (n=160)

Name of the constraints experienced	Beneficiaries (n_1=80)		Non-beneficiaries (n_2=80)	
	Frequency	Per cent	Frequency	Per cent
Technical constraints				
Non-availability of suitable implements	39	48.75	51	63.75
Soil and water conservation structures create problem in crop cultivation	35	43.75	38	47.50
Loss of top soil due to bunding	32	40.00	36	45.00
Lack of technical guidance	28	35.00	47	58.75
Lack of training	25	31.25	45	56.25
Non-technical constraints				
High cost of labours	70	87.50	80	100.00
Non-cooperation of neighbouring farmers	68	85.00	63	78.75
Loss of space for constructing structure	62	77.50	80	100.00
Difficulty to maintain the structures	42	52.50	47	58.75
Lack of required finance	42	52.50	47	58.75
Requires more labours	39	48.75	46	57.50
Non-availability of planting materials for live bunds	38	47.50	69	86.25
Small land holding	29	36.25	36	45.00
Risky to practice	26	32.50	56	70.00

training was noticed with more than fifty per cent non-beneficiaries (58.75 and 56.25%, respectively) and one-third beneficiaries (35.00 and 31.25%, respectively).

Whereas, the obstruction of conservation structure in crop cultivation and loss of top soil due to bunding were moderately expressed by both beneficiaries (43.75 and 40.00%, respectively) and non-beneficiaries (47.50 and 45.00%, respectively). Similar constraints were also reported in the studies conducted by Mansur *et al.* (2007) and Sisodia and Sharma (2008).

With respect to non-technical constraints (Table 3) the problems of high cost of labour and loss of space for constructing structures were largely expressed by all the non-beneficiaries and around 80 per cent of beneficiaries (87.50 and 77.50%, respectively). The non-cooperation of neighboring farmers was largely felt by beneficiaries (85.00%) than non-beneficiaries (78.75%). On the contrary risky to practice was noticed with more number of non-beneficiaries (70.00%) than beneficiaries (32.50%). Majority of non-beneficiaries (86.25%) and less than 50 per cent of beneficiaries (47.50%) highlighted the problems of non-availability of planting material for live bunds. The past studies conducted by Kadam *et al.* (2001) and Sisodia and Sharma (2008) also reported similar constraints in adoption of soil and water conservation practices.

The results of the study bring to focus that majority of both beneficiaries and non-beneficiaries exhibited low and medium perception about usefulness of soil and water conservation practices and believe that soil and water conservation practices are the management aspects. Hence, there is need for proper education of farmers through participatory approaches in realizing the adverse effect of soil erosion problems and motivate them to practice soil and water conservation practices. The problem of non-availability of suitable implements and lack of finance amongst majority of both beneficiaries and non-beneficiaries focus for popularizing and ensured availability of suitable low cost farm equipments and machineries. Similarly, the problem of cooperation of neighbouring farmers, not perceived the immediate benefits and uneven distribution of benefits stress for promoting those technologies which can be introduced on individual farm and are likely to give better results.

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