

ADOPTION BEHAVIOUR TOWARDS SOIL AND WATER CONSERVATION TECHNOLOGIES IN GUJARAT

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ABSTRACT : The study was conducted during 1993 in Navamota watershed in Khedbrahmna taluka of Sabarkantha district of Gujarat to assess the adoption behaviour of farmers towards soil and water conservation (SWC) practices. The majority of farmers are tribals (86 per cent) with small and fragmented land holdings. Agriculture is their main occupation and source of livelihood. The study revealed that the contour farming, intercropping, contour bunding, marginal bunding and agroforestry were the most favoured SWC practices by tribal farmers. The adoption level of SWC practices by tribals was medium and education and communication behaviour were found significant parameters with adoption behaviour of tribal farmers in the Navamota watershed.

Key words : Adoption behaviour; Communication; Education; Innovation ; Soil and water conservation technologies ; Gujarat

According to Rogers, "adoption process is the mental process through which an individual passes from hearing about an innovation to final adoption". Adoption is a sequence of thoughts and actions which an individual goes through, before he finally adopts a new idea (Reddy, 1987). Adoption behaviour varies from person to person, according to their knowledge and understandings. Some people accept innovations and put them into practices quickly, while some others are slow to put innovations in practice. Adoption of innovations also depends on situation and needs of the ultimate user. The objectives of the study were to i. assess the frequency distribution and adoption level of soil and water conservation practices by the farmers and ii. find out the interrelationship of socio-economic and personal traits with adoption behaviour of farmers.

MATERIALS AND METHODS

The study was conducted during 1993 in Navamota watershed located in Khedbrahmna taluka of Sabarkantha, the northern most district of

Gujarat, bordering Rajasthan. The watershed falls in the lower hills of Aravali belt having undulating topography, located at 24° 13' North latitude and 73° 01' East longitude at a height of 204 m above msl. Area of the watershed is 313 ha covering parts of Navamota, Umbora, Chhapra and Kheroj villages. The management plan of the watershed was developed by Central Soil and Water Conservation Research and Training Institute (CSWCRTI), Research Centre, Vasad, and implementation of works was started in 1984-85 by Gujarat State Land Development Corporation Limited, Ahmedabad.

Survey of all fifty farm families living in the watershed was carried out with the help of a structured schedule. The data were computed to find out the adoption behaviour of farmers towards SWC practices. The socio-economic traits were measured with the help of available scale of Trivedi and Parekh (1963). A three-point-continuum structured schedule was developed to measure the adoption behaviour of tribal farmers and scoring was done as score 0 for not aware; 1 for aware but not adopting and 2 for adopting. The mean scores

of adoption (\bar{X}) and standard deviation (SD) were computed. Adoption behaviour was categorised into three levels i.e. low level of adopter, if the total score of an individual is below $\bar{X} - (SD \times 0.5)$, medium level adopter, if this score is in between $\bar{X} - (SD \times 0.5)$ and $\bar{X} + (SD \times 0.5)$ and if individual score is above $\bar{X} + (SD \times 0.5)$, he was put under high level adopter category. To measure the interrelationship in between socio-economic and personal traits with adoption behaviour, the multiple regression analysis technique was used. To find out the communication behaviour of rural farmers the following simple relationship was hypothesized:

$$CB = \sum_{i=1}^n (F_i + C_i + A_i)$$

where,

CB is the communication behaviour of farmers; F_i is weightage of frequency use of communication and extension methods by farmers; C_i is weightage of credibility given to communication and extension methods by farmers and A_i is weightage of adoption behaviour of farmers towards SWC techniques (Khatik and Singh, 1995).

RESULTS AND DISCUSSION

Adoption Behaviour

Frequency distribution of different soil and water conservation practices adopted by tribal farmers in the watershed are given in Table 1. The practices were grouped into two categories on the basis of adoption by farmers, as i. adoption on individual basis ii. adoption on community basis.

Majority of farmers (90 per cent) have adopted "contour farming" practice; 3 farmers were aware but not adopting and only 2 farmers were unaware of the practice. The second most popular

Table 1. Frequency distribution of SWC practices adopted by farmers.

Technology	Not aware	Aware but not adopting	Adopting
i. Adoption on individual basis			
Contour farming	2	3	45
Intercropping	1	5	44
Cover cropping	38	9	3
Green Manuring	30	12	8
Mulching	42	8	-
Summer ploughing	13	29	8
Multiple cropping	33	13	4
Strip cropping	50	-	-
Land levelling	18	27	5
Bunding :			
a. Marginal bunding	24	6	20
b. Contour bunding	2	16	32
Terracing	29	18	3
Sodding of bunds	27	19	4
Grassed waterway	44	5	1
Agroforestry	6	27	17
ii. Adoption on community basis			
Peripheral bunding	50	-	-
Checkdam	11	38	1
Gully plug	43	7	-
Gully head protection works	49	1	-
Dugout pond	9	41	-
Silvipasture system in grazing land	38	9	3
Staggered planting on slopy land	49	-	1

SWC practice was "intercropping" with 88 per cent of adoption level; 5 farmers were aware of it but not adopting and only one farmer was unaware of it. The third important SWC practice was "contour bunding", in this practice out of the total 50 farmers 32 farmers were adopting the practice, 16 were aware but not adopting and only 2 were unaware about the practice. The fourth important SWC practice was "marginal bunding" in which out of total 50 farmers 20 farmers were adopting the practice, 6 farmers were aware but not adopting and 24 farmers were unaware about the practice. The fifth important SWC practice considered by tribal farmers was "agroforestry" in which out of the total 50 farmers 17 farmers were adopting 27 farmers were aware

but not adopting and 6 farmers were unaware of the practice. Strip cropping, peripheral bunding and gully head protection works were the other extremes as the respondents were not even aware of them.

The table 1 reveals that there were some important SWC practices, about which farmers were aware but not adopting. The such important practices were "dugout pond" not adopted by any farmer; whereas 41 farmers were aware but not adopting; "checkdam" was adopted by one farmer and 38 farmers were aware but not adopting; "summer ploughing" was adopted by 8 farmers and 29 farmers were aware but not adopting and followed by the "land levelling" was adopted by 5 farmers and 27 farmers were aware but not adopting. The farmers may not be able to adopt these practices due to high cost incurred in adoption or unsuitability to the field conditions. Therefore, the low cost soil and water conservation technologies, suitable and needed to the specific field conditions may be developed for their easy adoption by farmers. The adoption of SWC practices also depends on joint decision of community and their participation, particularly in those practices, which are adopted on community basis.

Adoption level

Adoption level of farmers towards soil and water conservation technologies in Navamota watershed is presented in table 2.

Table 2. Adoption level of soil and water conservation technologies

Adoption level	No. of respondents	Percentage	Mean	S.D.
Low level (Below 20.13 scores)	17	34		
Medium level (Between 20.13 to 26.55 scores)	23	46	23.34	6.43
High level (Above 26.55 scores)	10	20		

Majority of respondents were found medium level adopters of soil and water conservation practices in the Navamota watershed. The maximum 23 respondents were having medium level of adoption (46 per cent), 17 respondents were having low level of adoption followed by 10 respondents having high level of adoption towards soil and water conservation technologies. The results showed that out of the total 50 respondents 33 respondents included medium and high level of adoption of SWC practices, which indicates there is slight increase in adoption of SWC practices due to impact of integrated watershed management programme in Navamota watershed.

Interrelationship of socio-economic and personal traits with adoption behaviour

A set of seven variable were studied and defined as i. age : this refers to the chronological age of respondent at the time of investigation; ii. land holding refers to total area owned by the respondent iii. family size : total number of family members including male, female and children ; iv. education : referes to academic achievement attained by respondent through school and college; v. family education status : refers to an academic achievement attained by all family members of the respondent; vi. communication behaviour : use of different extension and communication methods for adoption of SWC practices and vii. adoption behaviour : response of farmers towards adoption of SWC innovations.

The regression analysis (table 3) of the six independent variables i.e. age, land holding; family size; education; family education status and communication behaviour with the dependent variable i.e. adoption behaviour were computed. 48 per cent variation in the dependent variable was explained by the independent variable ($R^2 = 0.48$). The regression equation is given below :

Table 3. Regression analysis of adoption behaviour of farmers.

Variables	Regression coefficient	'T' value
X ₁ Age	4.614	1.410
X ₂ Land holding	4.694	0.250
X ₃ Family size	-2.650	-0.122
X ₄ Education	1.140	3.226**
X ₅ Family education status	0.190	1.687
X ₆ Communication behaviour	0.110	2.451*
Constant		

Significant at 1** and 5* per cent level of probability, R² = 0.48

$$Y = 22.78 + 4.164 X_1 + 4.694 X_2 - 2.650 X_3 + 1.140 X_4 + 0.190 X_5 + 0.110 X_6$$

The education was found highly significant at 1 per cent level of probability with the adoption behaviour of tribals towards SWC technologies. Simultaneously, communication behaviour was also found significant at 5 per cent level of probability with adoption behaviour towards SWC technologies.

CONCLUSION

The present investigation indicates that

adoption behaviour of tribal farmers towards SWC practices has highly significant positive relationship with education. Therefore, the development of educational facilities in tribal areas and suitable low-cost technologies for tribal farmers will be the most important components for easy transfer of SWC innovations, and their adoption.

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