Techno-Economic Changes among the Farmers in Relation to Watershed Development Programme

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ABSTRACT

Conservation of natural resources is a pre-requisite for increasing production and productivity of the farming system. Development of watershed area is a strong step in this direction as it is helping in increasing the total irrigated area. This study was conducted in Maihar block of Satna district (M.P.). Findings of the study showed that 44.63 percent of respondents belonged to category of medium techno-economic change; where as 23.14 percent belonged to category of high techno-economic change. These techno-economic changes due to watershed development program were found to be associated with educational qualification, size of land holding, social participation, extension contact, innovativeness, economic motivation, information seeking behaviour, infrastructure facility and agricultural assets. Hence, watershed development should be promoted for bringing visible techo-economic change on sustainable basis.

Key words: Conservation; Watershed; Innovativeness; Economic motivation; Techno-economic change;

For sustaining food availability, conservation of soil and water resources is a pre- requisite. The deterioration of precious natural resources can be checked by adopting the water shed management practices. Integrated watershed development is a process by which land and water resources are conserved in situ. Out of the total geographical area (328.73 m.ha.) of the country only 143.70 m.ha. (43.72%) is under cultivation. Only 30 per cent of total cultivated area is under irrigation and the remaining 70 per cent (i.e. 108 mha) is under rain fed condition, and it accounts for 42 per cent of total food grain production. Watershed is a geographic area drained by stream or a system of connecting streams in such a way that all the surface run - off originating due to the precipitation in this area leaves the area in concentrated flow through a single outlet. The main objective of watershed development programme is to improve and sustain production and productivity at higher levels with better returns and diversification of sources of income. Eventually, this process tend to desirable changes in socio-economic status and adoption of technologies among the farming community. Hence integrated watershed development project has been accepted as a suitable model of growth for socio- economic development of dry land areas.

1. To study socio-economic and personal attributes of the beneficiaries and farmers involves in watershed programme.

2. To assess the techno-economic change among the respondents occurred due to adoption of watershed development programme.

3. To find out the extent of the association between the techno-economic change and selected characteristics of the respondents.

METHODOLOGY

The study was conducted in Maihar block of Satna district (M.P.). Where national watershed development programme (NWDP) is in operation since 2005-06. Jarjara Nala covers 15, villages. Out of those 120 benefeciaries from 7 villages were selected. The data was collected with the help of structured interview schedule. Chi-square test was applied to know the association between dependent and independent variables. Extent of association has been calculated by using co-efficient of association.

RESULTS AND DISCUSSION

Socio-economic and personal attributes: The data in Table 1 shows that majority of respondent (44.17%)

were in the middle age group followed by young (36.67%) and old (19.16 %). Thirty five per cent of respondents were educated up to primary level, whereas 25.83 per cent respondents were educated up to middle school level followed by educated up to high school level (25.83 per cent), Illiterate (9.17 %) and above high school level (8.33%) respectively. A clear cur difference was not observed in the respondents on the basis of caste as 38.33 per cent respondents belonged to OBC category followed by 31.66 per cent who belonged to SC/ST category and 30 per cent respondents belonged to general category. Most of respondents (44.17%) had medium size of family followed by large (28.33%) and small size of family (27.50%). About 44.17 per cent respondents had small size of land holding whereas 38.33 % had medium size of land holding. Only 17.50 per cent of respondents had large size of land holding.

Medium social participation was observed in 41.67 per cent respondents followed by low (31.67%) and high (26.66%) social participation. These finding are similar to findings of *Gupta (1998)*. Majority of respondent (41.67%) had medium extension contact followed by low (35.83%) and high (22.50%) extension contact. A fairly half of respondents (50%) were in the medium innovativeness category. Whereas 27.50 per cent of respondents had high and 22.50 per cent respondents had low innovativeness. Most of respondents (42.50%) had medium economic motivation followed by high (30.00 %) and low (27.50 %) level of economic motivation.

Information seeking behavior is an integral feature of innovators. It was observed that about (45.83%) respondents were having medium information seeking behavior followed by high (31.67 %) and low (22.50 %) level of information seeking behavior. Most of the respondents had moderate infrastructure facilities (44.17%) whereas 32.50 % respondents had more and 23.33 per cent respondents had less infrastructure facilities at their farms. It was observed that most of the respondent's possessed medium term of agricultural assets (48.33%) followed up by respondents who had short term (26.67%) and long term assets (25.00 %). These finding are similar to findings of *Gupta (1998), Mahnot et al (1992)*.

Techno-economic change refers to change in economic structure and adoption of changed / modified technologies among the farming community due to watershed. Table 2 shows the various factors of techno - economic changes and distribution of beneficiary farmers

Table 1. Frequency distribution of the respondents according to their socio-economic and personal attributes (N= 120)

Attributes	Categories	No.	%
Age	Young (<35 years)	44	36.67
	Middle (36-50 years)	53	44.17
	Old (> 50 years)	23	19.16
Education	Illiterate	11	09.17
	Primary	42	35.00
	Middle	31	25.83
	High School	26	21.67
	Above high school	10	08.33
Caste	SC/ST	38	31.67
	OBC	46	38.33
	General	36	30.00
Size of family	Small(Up to 4 members)	33	27.50
	Medium(5-6 member)	53	44.17
	Large(> 6 members)	34	28.33
Size of holding	Small (< 2 ha)	53	44.17
	Medium (2-4 ha)	46	38.33
	Large (> 4 ha)	21	17.50
Social participation	Low	38	31.67
	Medium	50	41.67
	High	32	26.66
Extension contact	Low	43	35.83
	Medium	50	41.67
	High	27	22.50
Innovativeness	Low	27	22.50
	Medium	60	50.00
	High	33	27.50
Economic motivation	Low	33	27.50
	Medium	51	42.50
	High	36	30.00
Information seeking behaviour	Low	27	22.50
	Medium	55	45.83
	High	38	31.67
Infrastructure facilities	Low	28	32.50
	Medium	53	44.17
	High	39	23.33
Agricultural assets	Short term assets	32	26.67
	Medium term assets	58	48.33
	Long term assets	30	25.00

in different categories. According to the rank the maximum techno-economic change occurred in the field of Nursery preparation and management (MS 2.09), followed by mixed farming (MS 2.03), and use of Recommended fertilizer dose (MS 2.00). Minimum techno- economic change occurred in Selection of suitable area for planting, may be due to less availability of land with farmers which does not leave much options with them. Looking to the individual category of highest response, 60 per cent of farmers has fallen under medium category of techno - economic change in making stop

Table 2. Distribution of beneficiaries according to practice wise techno- economic changes due to watershed development program (N=120)

Practices	Techno-economic change			Mean	Rank
	Low	Medium	High		
Nursery preparation and management	32 (26.66)	44(36.67)	44(36.67)	2.09	I
Planting Techniques	44(36.67)	64(53.33)	12(10.00)	1.72	XV
Selection of suitable crop varieties and trees species	40(33.33)	54(45.00)	26(21.67)	1.88	XI
Selection of suitable area for planting	36(30.00)	54(45.00)	30(25.00)	1.095	XVI
Contour bunding	42(35.00)	42(35.00)	36(30.00)	1.95	VI
Gully plugging	34(28.34)	66(55.00)	20(16.66)	1.88	X
Sunken pond	44(36.67)	36(30.00)	40(33.33)	1.96	V
Stop dam	32(26.67)	72(60.00)	16(13.33)	1.86	XII
Contour cultivation	41(34.16)	45(37.50)	34(28.34)	1.94	VII
Crop rotation	35(29.16)	63(52.50)	22(18.34)	1.89	IX
Strip cropping	43(35.83)	58(48.33)	19(15.83)	1.79	XIV
Mixed farming	33(27.50)	50(41.67)	37(30.83)	2.03	II
Recommended fertilizer dose	39(32.50)	40(33.33)	41(34.17)	2.00	III
Underground water resources	37(30.83)	68(56.66)	15(12.50)	1.80	XIII
Surface water resources	38(31.67)	52(42.33)	30(25.00)	1.92	VIII
Soil erosion	38(31.67)	56(46.67)	26(21.66)	1.89	IX
Production technology	36(30.00)	50(41.67)	34(28.33)	1.98	IV

Table 3. Distribution of beneficiaries according to the techno-economic change occured due to watershed development programme (N=120)

Categories	No.	%
Low change	38	32.23
Medium change	54	44.63
High change	28	23.14
Total	120	100

Table 4. Association of Techno-economic change with selected independent variables

Variable	χ^2	D.F.	Value of "C"
Age	4.066[NS]	4	-
Educational Qualification	22.69**	8	0.39
Caste	6.87[NS]	4	-
Size of family	2.40[NS]	4	-
Size of land holding	12.40*	4	0.306
Social Participation	14.564**	4	0.328
Extension Contact	12.10*	4	0.302
Innovativeness	14.625**	4	0.392
Economic Motivation	14.057**	4	0.323
Information seeking behaviour	12.982*	4	0.312
Infrastructure facilities	16.188*	4	0.344
Agricultural assets	15.582*	4	0.339

* Significant at 5% level of significant.
** Significant at 1% level of significant.
NS- non significant.

dam. It may be due to the reason that the major activity under watershed area is construction of stop dams.

Table 3 shows that changes vary from person to person. According to level of change it was observed that most

Table 5. Constraints faced by the respondents in follow up of the recommended practices of the watershed area

Constraints	Beneficiaries		Rank
	No.	%	
Technical Constraints			
Non availability of watershed techniques in time	68	56.66	IV
Lack of communication facilities	40	33.33	XII
Non availability of appropriate	46	38.33	XI
Economic constraints			
literature			
Poor financial condition	69	57.50	III
Non availability of loan on time	70	58.33	II
High cost of input	82	68.33	I
Lack of immediate returns	68	56.66	IV
Institutional constraints			
Lack of training institutions	56	46.66	VI
Lack of trainers at grass root level	55	45.83	VII
Political constraints			
Non cooperation of political leaders	52	43.33	VIII
Lack of technical knowledge of political leaders about watershed management practices	48	40.00	X
General Constraints			
Poor educational status of farmers	70	58.33	II
Lack of transportation facilities	51	42.50	IX
Conservativeness	58	48.33	V

of respondent (44.63%) belonged to medium category of techno - economic change followed by low category (32.23%) and (23.14%) of the respondent belonged to high category of techno-economic change. The result is

in the sync with the findings of *Palande et. al. (2001)* as well as with *Chandra Gowda and Jayaramiah (1990).*

Table 4 shows that out of twelve independent variables nine variable viz educational qualification, size of land holding, social participation, extension contact, innovativeness, economic motivation, information seeking behaviour, infrastructure facilities & Agriculture assets were found to have significant association with "Extent of Techno economic change" Only - age, caste, and size of family were found to have no significant association with their techno economic change due to watershed development programme. These finding are similar to those of *Siddahramiah (1991), Raghuvanshi and Jaulkar (1992), Sharma (1997).*

Out of all the significant variables educational qualification, size of land holding, social participation, extension contact, economic motivation, infrastructure facilities, information seeking behavior & Agricultural assets were found to have fair association with Techno economic change.

The data presented in Table 5 indicate that high cost of inputs was perceived as major constraints by the beneficiaries (68.33%) and ranked first. Poor educational status of farmers and non availability of agricultural loans on time were ranked second with 58.33 per cent. The other constraints perceived in the descending order of seriousness were "poor financial condition (57.50%)", non availability of watershed technique in time & lack of immediate returns in the program (56.66%) with rank III and IV respectively.

Conservativeness of villagers (48.33%), lack of training institution (46.66%), lack of proper trainers at grass root level (45.83%), non cooperation of political leaders (43.33), lack of transportation facilities (42.50%), lack of technical knowledge of political leaders about watershed management practices (40.00%), Non availability of appropriate literature (38.33%) and lack of communication facilities (33.33%) were ranked as V, VI, VII, VIII, IX, X, XI and XII.

CONCLUSION

The study reveals that the farmers of watershed area are on the verge of transformation. They are middle aged but establishing good contact and averaging their social participation. Although the majority had small size of land holding but a fairly number were in the medium innovativeness and medium economic motivation. This suggests the need of good extension and marketing linkages. To improve medium information seeking behavior of the majority awareness should be created regarding reliable information sources like KVKs and various ICT tools can be used to increase outreach of the information. Once a good linkage with the market or marketing channel will develop, infra structure facilities will increase rationally. Where as, provision of long term loan at low rate of interest to the farmers of watershed area can help in increasing agricultural assets.

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