

Study of Technological Knowledge Level about Watershed Practices in Morena District of Madhya Pradesh, India

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ABSTRACT

Level of the knowledge various watershed technologies by the farmers was studied in purposively selected watershed area in Morena district of Madhya Pradesh during 2010-11. A remarkable variation in the level of the knowledge of the various watershed practices was observed. The results of the study showed that knowledge level of farmers about soil conservation practices was low as compared to the rest of the selected practices. Further results indicate that level of knowledge of watershed technologies was associated with variables like education, size of family, size of land holding, annual income, occupation, attitude towards watershed programme, irrigation facilities, credit facilities, agricultural innovations and communication sources.

Key words: Watershed technologies; Agricultural innovations; Communication sources

About two-thirds of the country's cultivated land currently depends exclusively on rainfall, which is often erratic and poorly distributed. Water, soil and vegetation are the most vital natural resources for the survival of people. Watershed forms an integral component of these basic, natural resources. Watershed conditions influence the productivity of food, fuel, fodder, fiber and fruits. Growing demand for these items has extensively depleted the protective vegetative cover and exposed surface soils, which has resulted in partial to complete loss of nutrients and thereby reducing productivity and endangering vital life, support system. Experiences of many have also indicated that it is not very difficult to organize people around a profitable activity for some time but sustaining of such interest for a long period has been difficult. Madhya Pradesh being the largest state as well as maximum rainfed / dryland area of the country, Govt. of M.P has given high priority for the development of dry land agriculture on watershed basis where soil and moisture conservation efforts are being carried out. For Success of any development programme depends on degree of involvement of the people in the programme and at what level of knowledge they have about it. Keeping in view A Study of technological Knowledge level about Watershed Practices in Morena

District of Madhya Pradesh, India was under taken to find out the knowledge level of various watershed technologies by the farmers and the variables influencing the knowledge.

METHODOLOGY

The study was carried out purposively in Morena district during 2010-11. There are 6 milli watershed programmes in operation, consisting 10 micro watersheds. Out of these 10 micro watersheds, one micro watershed from each milli watershed selected for the study. Thus total 6 micro watershed villages were selected and 50 beneficiary farmers from each micro watershed were selected randomly as sample for the study, which participated in the watershed activities. Thus, total sample consisted of 300 farmers.

The data was collected with the help of pre tested schedule through direct interview. The statistical methods used for analysis of data were percentage distribution, mean, standard deviation and correlation analysis.

RESULTS AND DISCUSSION

Knowledge level about crop production: Table 1 reveals the level of knowledge about water conservation practices among the beneficiary farmers of the study

area. It can be observed from the above Table that out of 300 beneficiary farmers, 41.00 per cent had medium knowledge in respect of deep summer ploughing, followed by 33.67 per cent and 25.33 per cent beneficiaries who had high and low knowledge respectively. Regarding use of improved/hybrid variety seed, 45.67 per cent beneficiary farmers had medium knowledge while 38.33 per cent and 16.00 per cent beneficiaries had low and high knowledge respectively. About seed treatment methods, most of the beneficiary farmers (49.67%) had medium knowledge followed by 43.67 per cent had low knowledge and 21.33 per cent had high knowledge. In case of recommended seed rates, 42.67 per cent beneficiary farmers showed medium knowledge while 21.33 per cent showed high knowledge and 36.00 per cent showed low knowledge. Further observation of table reveals that most of the beneficiary farmers (48.33%) had medium knowledge regarding recommended dose of fertilizers followed by 45.33 per cent and 6.34 per cent beneficiary farmers had low and high knowledge respectively.

It can be observed from the above Table 1 that out of 300 beneficiary farmers, majority 50.33 per cent

Table 1. Level of knowledge of beneficiaries about crop production practices

Practices	Level of knowledge		
	Low	Medium	High
Deep summer ploughing	76 (25.33)	123 (41.00)	101 (33.67)
Use of improved seed	115 (38.33)	137 (45.67)	48 (16.00)
Seed treatment methods	131 (43.67)	149 (49.67)	20 (6.66)
Recommended seed rates	108 (36.00)	128 (42.67)	64 (21.33)
Recommended fertilizers	136 (45.33)	145 (48.33)	19 (6.34)
Intercropping	84 (28.00)	151 (50.33)	65 (21.67)
Crop rotation	91 (30.33)	163 (54.34)	46 (15.33)
Use of organic manure	73 (24.33)	141 (47.00)	86 (28.67)
Use of bio-fertilizers	103 (34.33)	168 (56.00)	29 (9.67)
Mulching	93 (31.00)	185 (61.67)	22 (7.33)

had medium knowledge in respect of intercropping followed by 28.00 per cent had low knowledge and 21.67 per cent had high knowledge. In case of crop rotation, majority of the beneficiary farmers 54.34 per cent showed medium knowledge while 30.33 per cent showed low knowledge and 15.33 per cent showed high knowledge. The table also reveals that 47.00 per cent beneficiary farmers had medium knowledge of use of organic manure followed by 28.67 per cent beneficiary farmers and 24.33 per cent beneficiary farmers had high and low knowledge respectively. It is also observed from the table that majority of the beneficiaries (56.00%) had medium knowledge of use of bio-fertilizers followed by 34.33 per cent and 9.67 per cent beneficiaries had low and high knowledge respectively. Majority of the beneficiaries had medium knowledge of mulching 61.67 per cent followed by 31.00 per cent had low and only 7.33 per cent had high level of knowledge.

Knowledge level about soil conservation practices: The data presented in Table 2 showing level of knowledge about soil conservation practices among the beneficiary farmers of the study area. It can be observed from the above Table that out of 300 beneficiary farmers, a huge majority, and 82.67 per cent had low knowledge in respect of construction of 'V' ditches for soil conservation, followed by 13.00 per cent and 4.33 per cent beneficiaries who had medium and high knowledge respectively. Regarding contour farming, big majority 78.00 per cent beneficiary farmers had low knowledge while 17.00 per cent and 5.00 per cent beneficiaries had medium and high knowledge respectively. About strip farming, majority of the beneficiary farmers 72.67 per cent had low knowledge followed by 20.33 per cent

Table 2. Level of knowledge of beneficiaries about soil conservation practices

Practices	Level of knowledge		
	Low	Medium	High
Construction of 'V' ditches for soil conservation	248 (82.67)	39 (13.00)	13 (4.33)
Contour farming	234 (78.00)	51 (17.00)	15 (5.00)
Strip farming	218 (72.67)	61 (20.33)	21 (7.00)
Cover crops	189 (63.00)	56 (18.67)	55 (18.33)
Pasture development	206 (68.67)	48 (16.00)	46 (15.33)

had medium knowledge and 7.00 per cent had high knowledge. In case of cover crops, 63.00 per cent beneficiary farmers showed low knowledge while 18.67 per cent showed medium knowledge and 18.33 per cent showed high knowledge. Regarding pasture development, 68.67 per cent beneficiary farmers had low knowledge while 16.00 per cent and 15.33 per cent beneficiary farmers had medium and high knowledge.

Knowledge level about horticultural and forestry practices: Table 3 reveals the level of knowledge about horticulture and forestry practices among the beneficiary farmers of the study area. It can be observed from the above Table that out of 300 beneficiary farmers, majority, and 53.00 per cent had medium knowledge in respect of mixed gardening, followed by 24.33 per cent and 22.67 per cent beneficiaries who had low and high knowledge respectively. Regarding construction of development of nurseries for a forestation, big majority 62.33 per cent beneficiary farmers had medium knowledge while 29.33 per cent and 8.34 per cent t beneficiaries had low and high knowledge respectively. About cultivation of vegetables, most of the beneficiary farmers 47.67 per cent had low knowledge followed by 34.33 per cent had high knowledge and 18.00 per cent had low knowledge. In case of cultivation of fruit and other medicinal plants, 49.34 per cent beneficiary farmers showed medium knowledge while 28.33 per cent showed low knowledge and 22.33 per cent showed high knowledge. Further observation of table reveals that maximum of the beneficiary farmers 43.67 per cent had

Table 3. Level of knowledge of beneficiaries about horticultural and forestry practices

Practices	Level of knowledge		
	Low	Medium	High
Mixed gardening	73 (24.33)	159 (53.00)	68 (22.67)
Development of nurseries for a forestation	88 (29.33)	187 (62.33)	25 (8.34)
Cultivation of vegetables	54 (18.00)	143 (47.67)	103 (34.33)
Cultivation of fruit and other medicinal plants	85 (28.33)	148 (49.34)	67 (22.33)
Plantation on boundaries	59 (19.67)	131 (43.67)	110 (36.66)
Plantation on wastelands	73 (24.33)	150 (50.00)	77 (25.67)

medium knowledge regarding plantation on boundaries while 36.66 per cent and 19.67 per cent beneficiary farmers had high and low knowledge respectively. It can be observed from the Table 3 that out of 300 beneficiary farmers, just half 50.00 per cent had medium knowledge in respect of plantation on wastelands followed by 25.67 per cent had high knowledge and 24.33 per cent had low knowledge.

Knowledge level about animal husbandry practices: In case of development of pasture for grazing, 44.00 per cent beneficiary farmers showed medium knowledge while 30.33 per cent showed low knowledge and 25.67 per cent showed high knowledge. Further observation of table reveals that majority of the beneficiary farmers 51.00 per cent had medium knowledge regarding tank/pond formation while 28.67 per cent and 20.33 per cent beneficiary farmers had low and high knowledge respectively. It can be observed from the above Table 4 that out of 300 beneficiary farmers, 48.00 per cent had medium knowledge in respect of Balance feeding to the animals followed by 27.33 per cent had high knowledge and 24.67 per cent had low knowledge. The table also reveals that 45.00 per cent beneficiary farmers had medium knowledge regarding vaccination of animals followed by 28.33 per cent beneficiary farmers and 26.67 per cent beneficiary farmers had low and high knowledge respectively.

Table 4. Level of knowledge of beneficiaries about animal husbandry practices

Practices	Level of knowledge		
	Low	Medium	High
Development of pasture for grazing	91 (30.33)	132 (44.00)	77 (25.67)
Recommended varieties of fodder	86 (28.67)	153 (51.00)	61 (20.33)
Balance feeding to the animals	74 (24.67)	144 (48.00)	82 (27.33)
Vaccination of animals	85 (28.33)	135 (45.00)	80 (26.67)

Knowledge level about water conservation practices: A close look on Table 5 reveals the level of knowledge about water conservation practices among the beneficiary farmers of the study area. It can be observed from the above Table that out of 300 beneficiary farmers, a big majority, and 62.67 per cent had medium knowledge in respect of construction of vegetative barriers, followed by 21.00 per cent and 16.33

Table 5. Level of knowledge of beneficiaries about water conservation practices

Practices	Level of knowledge		
	Low	Medium	High
Construction of vegetative barriers	49 (16.33)	188 (62.67)	63 (21.00)
Construction of checkdam /Earthan plughs	43 (14.33)	226 (75.33)	31 (10.34)
Deep ploughing for moisture conservation	31 (10.33)	185 (61.67)	84 (28.00)
Gabian structure	63 (21.00)	196 (65.33)	41 (13.67)
Construction of stop dams	44 (14.67)	178 (59.33)	78 (26.00)
Tank/Pond formation	28 (9.33)	196 (65.33)	76 (25.33)
Bori bandhaan	29 (9.67)	186 (62.00)	85 (28.33)
Gully plugging	42 (14.00)	181 (60.33)	77 (25.67)
Loose bolder check	22 (7.33)	192 (64.00)	86 (28.67)

per cent beneficiaries who had high and low knowledge respectively. Regarding construction of checkdam/earthan plughs, big majority 75.33 per cent beneficiary farmers had medium knowledge while 14.33 per cent and 10.34 per cent beneficiaries had low and high knowledge respectively. About gabian structure, majority of the beneficiary farmers 65.33 per cent had low knowledge followed by 21.00 per cent had low knowledge and 13.67 per cent had high knowledge. In case of construction of stop dams, 59.33 per cent beneficiary farmers showed medium knowledge while 26.00 per cent showed high knowledge and 14.67 per cent showed low knowledge. Further observation of table reveals that majority of the beneficiary farmers 68.67 per cent had medium knowledge regarding tank/pond formation while 26.00 per cent and 14.67 per cent beneficiary farmers had high and low knowledge respectively. It can be observed from the above Table 17 that out of 300 beneficiary farmers, 62.00 per cent had medium knowledge in respect of bori bandhaan followed by 28.33 per cent had high knowledge and 9.67 per cent had low knowledge. In case of gully plugging, 60.33 per cent beneficiary farmers showed medium knowledge while 25.67 per cent showed high knowledge and 14.00 per cent showed low knowledge.

The table also reveals that 64.00 per cent beneficiary farmers had medium knowledge followed by 28.67 per cent beneficiary farmers and 7.33 per cent beneficiary farmers had high and low knowledge respectively.

Over all Level of the knowledge regarding various watershed technologies: The level of knowledge of farmers was studied in terms of crop production practices, soil conservation practices, horticultural practices, animal husbandry practices and water conservation practices. The distribution of the respondents according to their level of knowledge about selected watershed technologies is shown in Table 6. It was observed that most of the respondents 49.66 per cent had medium knowledge about crop production practices, followed by 33.67 per cent respondents had low and 16.67 per cent had high level of knowledge. As regard to soil conservation practices, a huge majority 73.00 per cent of the respondents had low knowledge; followed by 17.00 per cent and 10.00 per cent respondents had medium and high level of knowledge respectively. In case of horticultural practices, 51.00 per cent respondents possessed medium level of knowledge, while 25.00 per cent and 21.00 per cent

Table 6. Level of the knowledge regarding various watershed technologies

Practices	No.	%
<i>Level of knowledge Crop production practices</i>		
Low	101	33.67
Medium	149	49.66
High	50	16.67
<i>Soil conservation practices</i>		
Low	219	73.00
Medium	51	17.00
High	30	10.00
<i>Horticulture practices</i>		
Low	72	24.00
Medium	153	51.00
High	75	25.00
<i>Animal husbandry practices</i>		
Low	84	28.00
Medium	141	47.00
High	75	25.00
<i>Water conservation practices</i>		
Low	39	13.00
Medium	192	64.00
High	69	23.00
Total	300	100

Table 7. Zero order correlation of antecedent variables of the respondents with their level of knowledge regarding watershed technologies

Variable	Correlation coefficient
Age	0.2809*
Caste	0.0351NS
Education	0.5214**
Size of family	0.3112**
Size of land holding	0.4131**
Annual income	0.3074**
Occupation	0.4126**
Agricultural assets	0.1311 NS
Attitude towards watershed programme	0.4728**
Irrigation facilities	0.3149**
Credit facilities	0.3320**
Agricultural innovations	0.4591**
Communication sources	0.6725**

** = Significant at p=0.01; * = Significant at p=0.05; NS = Non significant

respondents had high and low level of knowledge respectively. Maximum of the respondents of the study area i.e. 47.00 per cent had medium knowledge about animal husbandry practices followed by 28.00 per cent had low and 25.00 per cent had high knowledge. Further the data in Table 5 shows that 64.00 per cent respondents had medium level of knowledge about water conservation practices while 23.00 per cent and 13.00 per cent respondents had high and low knowledge. Thus, there was a considerable variation in the level of the knowledge of the farmers about various watershed development practices was observed in the study.

Correlation coefficients about knowledge level: The correlation coefficients of thirteen antecedent variables related to socio-economic, psychological and communicational attributes of respondents with their level of knowledge about various watershed technologies (consequent variable) were computed and presented in

Table-7. Correlation studies revealed that level of knowledge of farmers showed positive correlation with age, education, size of family, size of land holding, annual income, occupation, attitude towards watershed programme, irrigation facilities, credit facilities, agricultural innovations and communication sources at 1 per cent level of significance. Caste and possession of agricultural assets did not show significant relationship with overall knowledge of watershed technologies. It indicated that respondent’s education, size of family, land holding size, annual income, occupation, attitude, irrigation and credit facilities, agricultural innovations and communication sources did positively affected the respondent’s knowledge of watershed technologies while the remaining variables did not effect. The results are in agreement with the results of *Chandawat et al. (2004)*. *Chouhan, D.K. (2008)*. They also reported positive and significant correlation of education, land holding, availability of irrigation, annual income with knowledge of new farm technology. The results pertaining to age are in contrast to the findings of *Kadam et al. (2001)* who reported non-significant or significant positive association of age with knowledge of watershed technologies.

CONCLUSION

Majority of the respondents had medium to high level of knowledge of watershed technologies. The variable attitude of respondents towards watershed programme, education and training, Lack of active workers, Lack of transport facilities had strong positive correlation and high magnitude of effect on level of knowledge. Therefore, these were identified as dominant variables through which the level of knowledge of watershed technologies can be estimated.

Paper received on : September 03, 2014

Accepted on : November 18, 2014

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