RESEARCH FRONT

ISSN
(Print) 2320 – 6446, (Online) 2320 – 8341

SOCIO-ECONOMIC CHARACTERS OF FARMERS AND ADOPTION OF FARM POND TECHNIQUE IN UPPER KRISHNA BASIN OF MAHARASHTRA: A GEOGRAPHICAL ANALYSIS

Mrs. Dr. S. V. Gaikwad
Research Scholar in Geography
Dr. S. B. Gaikwad
Vice Principal, Miraj Mahavidyalaya, Miraj District- Sangli
Dr. V. D. Gaikwad
Assistant Professor in Geography, Devchand College, Arjunnagar, District- Kolhapur

ABSTRACT

Agriculture is major occupation of the region dominated by erratic nature of monsoon directly affecting on agricultural practices and also on the socio economic characteristics of the farmer. The climatic disturbance leads to adopt the water storage technique like farm pond as innovation in the eastern tahsils of the region. Present paper aims to study adoption of farm pond technique as innovation in the study area and socio-economic characters for adoption of farm pond technique in the region. For calculating the adoption score, modified formula of Kushire (1989) is used for farm pond holders, Chi Square (x^2) test and co-relation is also worked out with the Karl pearsons' co-relation co-efficient and 't' test for this purpose. The significance of the co-relation co-efficient is tested with the help of 't' table. The result derived shows there is no association between gender participation in adoption of farm pond technique. The association between the educational status and adoption score is significant shows the positive relation between the adoption of farm pond technique and the level of literacy. There is strong positive association between the occupational structure and adoption of the farm pond technique. It is also observed that there is significant association between the income groups and adoption score. The farmers of the region accepted the farm pond technique having awareness and knowledge of various innovations. There is Strong positive correlation, means, there is high awareness score goes with high level of current knowledge score and vice versa.

Key Words: Adoption, Farm Pond, Innovation, Correlation, Education, Occupation, Income Etc.

INTRODUCTION

Adoption is a mental process through which an individual proceeds from the stage of first knowing about an innovation to final adoption. If an innovation fails to get adopted then neither adoption nor diffusion has occurred. So adoption is sub process of diffusion (Mishra, 1968). In Upper Krishna Basin Farm pond technique becomes a new horizon to the agricultural development. It is also considered as mile stone in the agricultural development. Especially the drought prone region of the Maharashtra has facilitated by this new innovative technique. The innovative farmer Shri. Namdev Bapu Mane, village Sawarde of Tasgaon tahsil was inspired by the Israel farmers and firstly introduced the 'Water Bank' technique for the agricultural purpose in the region. When he was visited to the Israel in 1993 he gets idea about the spreading of polythene paper in the tank. For reducing the percolation capacity of the tank this paper technique gives more output and water throughout the year. He constructed farm pond by digging the field in1997 for fulfill the demand of water for agricultural purpose. The government of Maharashtra started the scheme as *Shet Tale* for the drought prone regions of the Maharashtra. The subsidy is made available by the government in the districts of Maharashtra in which some of the tahsils in Upper Krishna Basin are get

ISSN
(Print) 2320 – 6446, (Online) 2320 – 8341

benefits from this scheme. The government also provides (Silpoline) plastic sheets for the tanks. Maharashtra government recently started subsidy for plastic sheets as well.

STUDY AREA

The Upper Krishna Basin of Maharashtra is selected as a study region for present study. The area lies between 15^0 49′ North and 18^0 02′ North Latitude and 73^0 33′ East and 74^0 58′ East Longitude. The region covers an area of 20,769 Sq. Kms. which is 6.74 per cent to state and supports to 85, 29,387 populations (2011) include 71.67 per cent of rural and 28.33 per cent of urban population. The region is administratively subdivided in to 28 tahsils and comprises the southern part of Maharashtra. It includes whole Kolhapur, parts of Satara excluding tahsils like Man, Phaltan, Khandala and part of Sangli district excluding tahsils like Jath and Atpadi. The physiography of the region can be explained into three distinct zones viz. the western hilly zone, the central plains and the eastern undulating zone. The western boundary is well defined by the Western Ghats between Ratanagiri and Sindhudurg district. In the North and North East part of the region is separated from the Bhima basin by Mahadeo hill range. The river Krishna flows for a distance of about 364 kms. and its total course of 1280 kms. The region is part of 'Deccan Trap' composed of pre-Cambrian crystalline rocks which supported a variety of soils. The soil is quite variable from place to place and even from field to field helps to agricultural development in the region. Rainfall plays a very important role in the lives of the people who are involved in agriculture. About 80 per cent rainfall is concentrated during rainy season .The pattern of rainfall all over the region reflects the climatic variation in the different parts which decreases west to east in the region. Many agricultural innovations are found and adopted by the farmers by considering climatic condition are Drip and Sprinkler irrigation technique. In eastern draught proven tahsils of the region the farmers are adopted farm pond technique of water storage for agricultural practice.

OBJECTIVES

To study adoption of farm pond technique as innovation in the study area.

To study socio-economic characters and adoption of farm pond technique in the region.

HYPOTHESIS

Socio-economic condition of the farmer is directly affecting the adoption of farm pond technique

DATA SOURCE AND METHODOLOGY

Present research work is based on the primary data which is collected by intensive field work through interview technique. For detailed analysis of farm pond technique out of 5893 farm pond holders about 5 per cent sampling farm pond holders are selected with the stratified random purposive sampling. About 295 respondents have interviewed where as about 50 per cent to the selected samples none adopters of farm pond are interviewed. For calculating the adoption score, modified formula of Kushire (1989) is used for calculating the adoption score for farm pond holders is as under,

Adoption score = 2012- A

Here, 'A' is the actual year when the farmers have adopted the farm pond technique. Shri. Namdev Keshav Mane, Who have adopted farm pond technique in year 1997 has given at adoption score 15. The government has taken efforts from 2005 for farm pond technique under various schemes. So adoption score is categorized as under

i. 0- 2 Adoption Score –Low
ii. 3- 4 Adoption Score- Moderate
iii. 5 and Above Adoption Score- High

On the basis of this all the respondents adopted farm pond technique are categorized with various groups. With the help of this analysis, various hypothesis are to be tested with

ISSN
(Print) 2320 – 6446, (Online) 2320 – 8341

Chi Square (x^2) test and co-relation is also worked out with the Karl parsons' co-relation co-efficient and't' test for this purpose. The significance of the co-relation co-efficient is tested with the help of't' table.

ANALYSIS

A) Socio Economic Characteristics of farmer and Adoption:

The social characteristics of the farmers like Age Group, Participation of Gender, Educational Status, and Occupational Structure, Income Groups and awareness and Knowledge are elaborated as under.

I. Age Group:

The farmers those who have adopted the farm pond technique are young and middle aged. These farmers are engaged in horticulture and floriculture as commercial agricultural practices. About 46.10 per cent of the farmers belong to the middle age followed by young and farmers of above 40 years (Table 1.1).

Table 1.1 Distribution of Farm Pond Holders by Age Group and Adoption Score

Adoption score	Age Groups			Total
	Below 30	30 to 40	Above 40	
Low (0-2)	19	74	21	114
Medium (3-4)	46	49	19	114
High (5& Above)	42	13	12	67
Total	107	136	52	295

Source: Based on Field Survey, Data Compiled by Author.

The Chi Square =44.94, d. f. =4 P- Value=0.00001 Significant at 0.05 per cent

The farmers engaged horticulture and grape vine in eastern tahsils like Tasgaon, Kavthemahankal, Khanapur are suffering problem of water storages and scarcity of water so they accepted the innovation.

For identity the association between the age group and adoption score x^2 Chi square value is 44.94. The critical value at 4 degree of freedom at 0.05 per cent significant level is 9.49. The calculated x^2 value is greater than the critical value which shows the significant association between these two variables

The peoples those who have not adopted such innovation are having good irrigation sources in central part of the region. About 44.90 per cent of the people from the age of above 50 are followed by 31.97 per cent of middle aged and 32.13 per cent of young rejected this innovation because they are doing traditional agriculture and they are cultivated fodder crops. So they do not thing about water storage facility

II. Participation of Gender

The support of female to the male farmers is the important factor in the agricultural activity. The females are also plays an important role in the agricultural practices (Table 1.2). In adoption of farm pond the female participation is not significant. For analyzing the association between the gender participation and adoption score, Chi square is calculated.

Table No.1.2 Distribution of Farm Pond Holders by Gender Participation and Adoption Score

Adoption score	Gender		Total
	Male	Female	
Low (0-2)	87	13	100
Medium (3-4)	98	5	103
High (5& Above)	83	9	92
Total	268	27	295

Source: Based on Field Survey, Data Compiled by Author.

The Chi Square =4.11, d. f. =2, P- Value=0.12, Significant at 0.05 per cent

ISSN
(Print) 2320 – 6446, (Online) 2320 – 8341

The chi square calculated value is 4.11 which are smaller than the tabulated value for 2 degree of freedom at 0.05 per cent significant level. So the result shows the association between gender participation in adoption of farm pond technique is not significant (Table 1.2). The major cause of this is the dominance of male in the Indian culture.

The percentage of none adopter farmer's shows that, about 97.28 per cent of the farmers are rejected the farm pond technique. These farmers have small piece of agricultural land and they are engaged in tradition agricultural subsistence agricultural system.

III. Educational status

In region most of the farmers adopted in agricultural activities are studied up to 12$^{th.}$ The percentage of graduate and post graduate is 31.52 and 32.05 respectively (Table 1.3). Simply it is observed that, the farmers are engaged in commercial agricultural system are highly adopted this innovation. For analyzing the association between the educational status and adoption score of farm pond, Chi square test is applied here.

The calculated chi square value is 18.86. The tabulated value for 4 degree of freedom at 0.05 per cent significant level is 9.49 (Table 1.3). It is observed that, the calculated value of x^2 Chi square is greater than the critical value so the association between the educational status and adoption score is significant.

Table No. 1.3 Distribution of Farm Pond Holders by Educational Status and Adoption Score

	Educational Status			
Adoption score	**Below 12th**	**Graduate**	**Post Graduate**	**Total**
Low (0-2)	35	41	29	105
Medium (3-4)	41	29	27	97
High (5& Above)	58	23	12	93
Total	134	93	68	295

Source: Based on Field Survey, Data Compiled by Author.

The Chi Square =18.86, d. f. =4, P- Value=0.000836 Significant at 0.05 per cent

The non adaptors percentage shows that, about 60.54 per cent of the land holders are post graduated and they are worked in other various services. They do not given their time to the agricultural activities. The peoples who have graduation they are also engaged in other activities and some of them having small area are engaged in subsistence agriculture on monsoon. So they do not adopted farm pond technique as innovation for water storage.

IV. Occupational Structure:

In the region about 69.15 per cent of the respondents are fully engaged in agricultural activities. For meeting the demand of sufficient water for the grapevine and commercial crops formers is adopted farm pond technique as water storage facility. The table 1.4 shows that, the association between occupational structure and adoption score. It is observed that, if the participation of the peoples in agricultural activity they will adopt the farm pond as innovative technique. For understanding the association between these two aspects the x^2 chi square test is computed.

Table No. 1.4 Distribution of Farm Pond Holders by Occupational Structure and Adoption Score

	Occupational Structure			
Adoption score	**Agricultural Farming**	**Service**	**Other**	**Total**
Low (0-2)	34	23	17	74
Medium (3-4)	41	18	11	70
High (5& Above)	129	13	9	151
Total	204	54	37	295

Source: Based on Field Survey, Data Compiled by Author.

The Chi Square =41.33, d.f. =4, P- Value=0.00001 Significant at 0.05 per cent.

ISSN
(Print) 2320 – 6446, (Online) 2320 – 8341

The result of Chi square x^2 shows that, the calculate value of Chi square is 41.3. The tabulated value for 4 degree of freedom is 9.49 at 0.05per cent significant level. If the calculated value of chi square is greater than the tabulated critical value of there is strong positive association between the occupational structure and adoption of the farm pond technique.

The none adopters of the farm pond technique out of 147 respondent's bout 65.31 per cent of the respondents are engaged in various types of services so they do not thing about the agricultural activities positively. The 21.77 per cent of the peoples are engaged in other activities so they do not think about adoption of farm pond technique.

V. Income Group:

The farmers engaged in commercial agricultural are have good annual income. The income group of the respondents is categorized in four categories and computed with the adoption score of the farm pond. The farmers of 2-3 lack annual income is highly adopted this technique as an innovation, followed by farmers of and below 1-2 lack and below 1 lack income group (Table 1.5). For understanding the association between the income group and adoption score the chi square test is computed.

Table No. 1.5 Distribution of Farm Pond Holders by Income Group and Adoption Score

Adoption score	Income group				Total
	Below 1 Lack	1-2 Lack	2-3 Lack	4 Lack and Above	
Low (0-2)	21	38	63	9	131
Medium (3-4)	13	32	49	7	101
High (5& Above)	25	17	15	6	63
Total	59	87	127	22	295

Source: Based on Field Survey, Data Compiled by Author.

The Chi Square =23.46, d. f. =6 P- Value=0.05 Significant at 0.05 per cent

The calculated Chi square x^2 is 23.46. The tabulated value for 6 degree of freedom at 0.05 per cent significant level is 12.59. It is observed that, the calculated value of chi square is greater than the tabulate value. So it shows significant association between the income groups and adoption score. Here it is observed that the proposed hypothesis becomes positive in relation with the adoption of farm pond technique and economic status of the farmer.

Out of 147 none adopter respondents, about 43.54 per cent of the farmers have income below l lack followed by 38.78 per cent of 1 to 2 lack and 11.56 per cent of 2-3 lack. It shows that, the low income groups peoples are practicing subsistence type of agriculture based on the monsoon climate, so they do not have need of water storage facilities. So these peoples are rejected the farm pond technique as a innovative technique for water storage.

VI. Awareness and Current Knowledge

In region out of 295 respondents about 100 per cent of the farmers have awareness and knowledge about the chemical fertilizers, use of H.Y.V. seeds, use of pesticides and improved agricultural implements.

Table 1.6 Awareness of Farm Pond holders by their Knowledge of selected Innovative Technique

Innovation	Awareness	Current Knowledge	per cent of Farmers Aware about Innovation	per cent of Farmers Having Current Knowledge
Greeen Manuaring	226	146	146.00	49.49
Chemical Fertilizers	295	295	100.00	100.00
Organic Fertilizers	32	28	10.85	9.49
Mixed Fertilizers	295	289	100.00	97.97
Wormy Compost	12	9	4.07	3.05

ISSN
(Print) 2320 – 6446, (Online) 2320 – 8341

HYV Seeds	295	295	100.00	100.00
Seed treatments	237	231	80.34	78.31
Use of Pestisides	295	295	100.00	100.00
Improved Agricultural Implements	295	295	100.00	100.00

Source: Based on Field Survey, Data Compiled by Author.
Pearson's Correlation co-efficient (r = 0.97) t= 2.78 Tabulated Value at 2per cent level.

It is also observed that, the 65.42 per cent of the respondents have awareness about soil-testing, 80 per cent of the respondent having awareness about seed treatment (Table 1.6). There is small quantity of farmer having awareness about organic fertilizers and wormy compost. It is only because of the farmers engaged in commercial agriculture. For analyzing the co-relation between the awareness and current knowledge, Karl Pearson's Co-efficient of Co-relation method is computed with the student't' test.

The results derived that, the calculated value of 'r' is 0.97 which shows strong positive correlation, which means that, there is high awareness score goes with high level of current knowledge score and vice versa. The student "t" test is also shows 2.78 value at tabulated value of 2 per cent is significant. The farmers of the region accepted the farm pond technique having awareness and knowledge of various innovations.

CONCLUSION

The analysis of the data reveals that, the process of adoption of innovation is depend upon the Social and economic characters of the farmers. The socio economic characters like age group participation of gender, educational status, occupational structure, income groups, and awareness and current knowledge regarding innovations are helps to adoption of farm pond technique in the region. The statistical analysis shows that, there is strong association between the Age group, Participation of Gender, Educational Status, Occupational Structure, Income Group and Awareness of current Knowledge for the adoption of the farm pond technique.

It is also observed that there is no significant relation between the participation of gender and adoption of the farm pond techniques. In eastern and north eastern part of the region farmers engaged in commercial agricultural are adopted the farm pond technique as an innovation.

REFERENCES

1. Mishra, R. P.(1968): " Diffusion of Agricultural Innovations: A theoretical and Empirical Study, Prasaranga University of Mysore, pp 49

2. Mohamad, Noor (1978): Impact of Social factors on Diffusion of Agricultural Innovations in Central Trans, Ghagra Plain, The national Geographical Journal of India Vol XXX. Part 1 and 2, March, June 1978 pp 36-46.

3. Kushire, K. S. (1989): "Diffusion of Agricultural Innovations in Walwa tahsil of Sangli District (Maharashtra), A Unpublished Dissertation Submitted to the Shivaji University, Kolhapur for Degree of Master of Philosophy in Geography.

4. Patil S. P. (2014): "Diffusion of Agricultural Innovations in Upper Krishna Basin of Maharashtra: A Geographical Study, An Unpublished Dissertation Submitted to the Shivaji University, Kolhapur for Degree of Doctor of Philosophy in Geography.

5. www. socscsistatics.com/test/chisquare/default2.aspx

6. www. socscsistatics.com/test/pearson/default.aspx