DOI: 10.15740/HAS/AU/12.3/437-442
Agriculture Update
Volume **12** | Issue 3 | August, 2017 | 437-442
Visit us : *www.researchjournal.co.in*
e ISSN-0976-6847

RESEARCH ARTICLE :

Socio-economic impact of farm pond in enhancing the livelihood of farming community of Maharashtra

A.M. CHAVAI AND S.B. SHINDE

ARTICLE CHRONICLE :
Received :
20.05.2017;
Revised :
29.06.2017;
Accepted :
11.07.2017

KEY WORDS :
Role of farm pond, Crop productivity, Cropping intensity, Income, Livelihood

Author for correspondence :
A.M. CHAVAI
Department of Extension Education, Post Graduate Institute, Mahatma Phule Krishi Vidyapeeth, Rahuri, AHMEDNAGAR (M.S.) INDIA
Email: anandchavi.2009@gmail.com

See end of the article for authors' affiliations

SUMMARY : The study revealed that due to the availability of protective irrigation facility from farm pond the majority of *Kharif* and *Rabi* crops showed increase in average productivity *viz.*, pigeonpea (34.38%) and green gram (20.35%) while *Rabi* crops wheat (30.16%), *Rabi* sorghum(27.44%) and gram (19.67 %). Whereas in case of vegetables it was increased by 13.20 per cent . The change in cropping intensity revealed that the gross cropped area increased by 8.41 per cent after construction of farm ponds. The cropping intensity was 106.11 per cent whereas after construction of farm ponds it was 115.03 per cent. The per cent change in cropping intensity was observed as 8.91 per cent to the base year. As for as *Kharif* crops are concerned there were no much change in area. However, the per cent change in total *Rabi* crops area was relatively more after construction of farm ponds. The area under *Rabi* sorghum, wheat, gram and vegetable crops (tomato, chilli, brinjal) were increased by (60.68%), (27.60%), (8.26 %) and (3.66) per cent to the total *Rabi* area, respectively. The gross cropped area was increased which may help farmers to bring more area under *Rabi* crops. Moreover, the availability of water in farm ponds had resulted in diversification of the cropping pattern with the substitution of more profitable crops. Therefore, in order to bring fallow land under cultivation and to increase cropping intensity, farmers need to be encouraged to follow adoption of farm pond technology in changing cropping intensity which may help the beneficiary for the socio-economic upliftment. After the construction of farm ponds majority (27.85%) of beneficiary farmers were having their annual income in range of Rs. 225001 to Rs. 300000/- followed by (27.14%) beneficiaries found in the category of Rs.300001 and above. The per cent change in annual income was 17.11 per cent. The independent variables *viz.*, land holding, area under protective irrigation, risk preference and extension contact showed positive and highly significant relationship with overall impact of farm pond. The constraints such as farm pond sedimentation followed by disturbances of cow, pet and wild animals, with regard to getting subsidy's, unawareness about farm pond scheme, high rate of evapotranspiration during summer season, large area in hectares of productive land goes under farm pond construction were expressed by the farming community.

How to cite this article : Chavai, A.M. and Shinde, S.B. (2017). Socio-economic impact of farm pond in enhancing the livelihood of farming community of Maharashtra. *Agric. Update*, **12**(3): 437-442; **DOI : 10.15740/HAS/AU/12.3/437-442.**

BACKGROUND AND OBJECTIVES

Farm ponds are created in various states of India along with Maharashtra. The main aim of construction farm pond is to made the availability of protective irrigation at critical

growth stages of crop. In Maharashtra through various schemes of government the farm ponds are allotted to farmers namely *viz.*, National Horticultural Mission, MGNERGA, Mahatma Phule Jal Abhiyan etc. The farm pond have a great impact on enhancing the livelihood of farming community through changing the crop productivity as well as cropping intensity. It also help in changing the economic situation of farmers. The area under irrigated crops also increases due to the construction of farm pond. In view of this, the present study was conducted in the year 2014 with the objectives to study the socio-economic impact of farm pond in enhancing the livelihood of farmers in terms of change in productivity, cropping intensity, income of the farmers, to study the constraints faced by the farm pond beneficiaries in adoption of farm pond technology and to study the relationship of independent variables with dependent variable.

RESOURCES AND METHODS

The present study was undertaken in scarasity zones Madha and Karmala tahsils of Solapur district of Maharashtra , India having maximum farm ponds. 14 villages were selected from two tahsils along with 10 farmers from each village. Thus, 140 respondent farmers were selected. Primary data were collected with the help of pretested interview scheduled specially designed in local language for the purpose. Statistical tools like mean, percentage, standard deviation and Karl Pearson's correlation co-efficient were used for the analysis of data.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Change in productivity of crops :

The change in productivity refers to economic yield or production of plant produced of economic importance, expressed in standard units per unit area. The per cent change in productivity of crop were measured on the basis of difference between the average productivity of different crop in q/ha during the study year and base year. It is revealed from Table 1 that, majority of *Kharif* and *Rabi* crops showed increase in average productivity *viz.*, pigeonpea (34.38%) and green gram (20.35%) were increased in average productivity over base year. With regards to *Rabi* crops there was change in average productivity in wheat (30.16%), *Rabi* sorghum (27.44%) and gram (19.67 %). Whereas in case of vegetables it was increased by 13.20 per cent. From the above findings it was concluded that there was definite impact of farm ponds on increasing the productivity of different *Kharif* and *Rabi* crops mostly due to the avalibility of protective irrigation facility from farm pond. These findings are similar with the findings of Desai *et al.* (2007).

Change in cropping intensity :

The change in cropping intensity due to construction of farm pond was studied in terms of hectares covered under various crops before and after construction of farm pond to base year 2010 -2011.

Thus, it is concluded from the Table 2 that, after construction of farm ponds the area in hectares in most of the crops has been changed. A critical observation of change in cropping intensity revealed that the gross cropped area increased by 8.41 per cent after construction of farm ponds over before construction of farm ponds. Before construction of farm ponds the

Table 1 : Distribution of *Kharif* and *Rabi* crops according to their change in productivity (n=140)

Sr. No.	Crops	Respondents		
		Before farm pond (Quintals/ha)	After farm pond (Quintals/ha)	Percentage change (%)
Kharif				
1.	Pigeonpea	16.84	22.63	34.38
2.	Green gram	8.45	10.17	20.35
Rabi				
1.	Wheat	22.11	28.78	30.16
2.	*Rabi* sorghum	17.89	22.80	27.44
3.	Gram	12.91	15.45	19.67
4.	Vegetables (Tomato, chilli, brinjal)	183.80	208.07	13.20

cropping intensity was 106.11 per cent whereas after construction of farm ponds it was 115.03 per cent. After construction of farm ponds the per cent change in cropping intensity was observed as 8.91 per cent to the base year. As for as *Kharif* crops are concerned there were no much changes in area. However, the per cent change in total *Rabi* crops area was relatively more after construction of farm ponds. The area under *Rabi* sorghum, wheat, gram and vegetable crops (tomato, chilli, brinjal) were increased by (60.68%), (27.60%), (8.26 %) and (3.66) per cent to the total *Rabi* area, respectively. The gross cropped area was increased which may help farmers to bring more area under *Rabi* crops. Moreover, the availability of water in farm ponds had resulted in diversification of the cropping pattern with the substitution of more profitable crops. Therefore, in order to bring fallow land under cultivation and to increase cropping intensity, farmers need to be encouraged to follow the adoption of farm pond technology in changing cropping intensity which may help the beneficiary for the socio-economic upliftment. Similar types of findings were observed by Desai *et al.* (2007)

Change in annual income :

Annual income provides capital for farming. It is assumed that annual income plays an important role in socio – economic dimensions of the farmers. Hence, this variable was considered for the present study.

It was found from Table 2 that in before farm pond construction relatively higher proportion (32.86 %) of the beneficiary farmers were having their annual income Rs. 1,50001 to 2,25000/- followed by, (22.85%) were having Rs. 3,00000 and above, whereas 20.71 per cent were having their annual income upto Rs. 75,000 and only (12.85%) and (10.73%) of the beneficiary farmers having their annual income ranging from Rs. 2,25001 to 3,00000 and Rs. 150001 to 225000, respectively. After the construction of farm ponds majority (27.85%) of beneficiary farmers were having their annual income in range of Rs. 225001 to 300000/- followed by (27.14%) beneficiaries were found in the category of Rs. 300001 and above whereas, (24.28%) were having annual income ranging from Rs. 150001 to 225000/- and (20.73%) of the beneficiary farmers were having their annual income ranging from Rs. 75001 to 150000/-. The per cent change in annual income after construction of farm pond was 17.11 per cent. From the above findings it can be noted that after construction of farm ponds the annual income of beneficiaries was increased. These findings are supported by the findings of Desai (2005)

Socio-economic impact of farm pond on beneficiaries :

The impact of farm ponds on beneficiaries has been studied in terms of change in productivity, change in cropping intensity and change in annual income measured in terms of per cent change. The data thus obtained have been furnished in Table 4. The productivity of major crops *i.e.* pigeonpea, *Rabi* sorghum, gram and wheat were considered because as the farmers grown theses

Table 2 : Cropping intensity before and after construction of farm pond **(n=140)**

Sr. No.	Crops	Respondents			
		Area before farm ponds (ha)	Per cent	Area after farm ponds (ha)	Per cent
Kharif					
1.	Pigeonpea	232.7	76.97	262.8	86.93
2.	Green gram	69.6	23.02	39.5	13.07
	Kharif Total	302.3	100	302.3	100
Rabi					
1.	*Rabi* sorghum	189	55.71	238.5	60.68
2.	Wheat	78	22.99	108.5	27.60
3.	Gram	67	19.75	32.5	8.26
4.	Vegetable (Tomato, Chilli and Binjal)	5.20	1.55	14.50	3.66
	Rabi Total	339.2	100	393	100
	Gross cropped area (A+B) before farm ponds	641.5		695.5	
	Percentage change in *Kharif* and *Rabi* area		8.41		
	Net cultivated area		604.2		
	Cropping intensity	106.11		115.03	8.91

crops on more acreage. A cursory look at Table 4 revealed that mean of annual income (Rs. 2.53 lakhs), cropping intensity (115.03%), productivity of major crops *viz.,* pigeonpea, *Rabi* sorghum, gram and wheat were (22.63q/ha), (28.78q/ha), (22.80q/ha) and (15.45q/ha), respectively of beneficiaries after construction of farm ponds were higher than the mean of annual income (Rs. 2.16 lakhs), cropping intensity (106.11%), productivity of major crops *viz.*, pigeonpea, *Rabi* sorghum, gram and wheat were (16.84q/ha), (22.11q/ha), (17.89q/ha) and (12.91q/ha), respectively on before the construction of farm ponds. It was also found that there was a change in cropping intensity, productivity of major crops *viz.*, pigeonpea, *Rabi* sorghum, gram and wheat, annual income to the tune of 8.91, 34.38, 30.16, 27.44, 19.67 and 17.11 per cent, respectively after construction of farm ponds.

Because of the availability of water for irrigation, it resulted changing in area, increases in cropping intensity and yield levels and thereby increased the annual income of the beneficiary farmers of farm ponds.

When impact as a whole was considered, it is evident from Table 4 that there was total impact of 22.94 per cent of farm ponds on the beneficiaries. It could, therefore be stated that there was definite positive impact of farm ponds on the beneficiaries in terms of change in cropping intensity, productivity of major crops and annual income. The findings of the present study are similar with to the findings of Bhange *et al.* (2005) and Bagdi *et al.* (2001).

Relationship between the socio-economic profile with their change in annual income and with overall Impact of farm pond :

It is apparent from Table 5 that the variables *viz.*, land holding, area under protective irrigation, risk preference and extension contact showed positive and highly significant relationship with change in annual income at 0.01 per cent level of probability whereas, the variables family type, social participation and utility perception were found to be significant at 0.05 per cent level of probability. The other variables such as age and education showed non-significant relationship with the change in annual income. Thus, the Null hypothesis for these non- significant variables, therefore, was accepted.

Constraints faced by the farm pond beneficiary farmers :

The constraints faced by beneficiaries while utilizing farm pond water have been studied and presented in Table 6 that, large majority of the respondents (65.00%)

Table 3 : Distribution of respondents according to their change in annual income (n = 140)

Sr. No.	Annual income (Rs.)	Respondents			
		Before farm ponds		After farm ponds	
		Frequency	Per cent	Frequency	Per cent
1.	Up to 75,000 /-	29	20.71	00	00
2.	75001 to 150000/-	15	10.73	29	20.73
3.	150001 to 225000/-	46	32.86	34	24.28
4.	225001 to 300000/-	18	12.85	39	27.85
5.	300001 and above	32	22.85	38	27.14
	Total	140	100	140	100
	Mean	216357.14		253386.10	17.11

Table 4 : Overall impact of farm ponds on beneficiary farmers (n=140)

Sr. No.	Dimensions of Agricultural development	Respondents		
		Before (mean)	After (mean)	Change
1.	Cropping intensity	106.11	115.03	8.91
2.	Productivity			
	Pigeonpea	16.84	22.63	34.38
	Wheat	22.11	28.70	30.16
	Rabi sorghum	17.89	22.80	27.44
	Gram	12.91	15.45	19.67
3.	Annual income	216357.14	253386.10	17.11
	Total impact		22.94 %	

Table 5 : Coefficient of correlation with change in annual income and overall impact of farm pond on beneficiary farmers

Sr. No.	Variables	'r' values annual income	'r' values overall impact
1.	Age	0.036NS	0.036NS
2.	Education	0.012NS	0.012NS
3.	Land holding	0.941**	0.941**
4.	Family type	0.142*	0.142*
5.	Social participation	0.143*	0.143*
6.	Area under protective irrigation	0.921**	0.921**
7.	Risks preference	0.460**	0.460**
8.	Extension contact	0.321**	0.321**
9.	Utility perception	0.132*	0.132*

* and ** indicate significance of values at P=0.05 and 0.01, respectively

Table 6 : Distribution of beneficiary farmers according to constraints faced by them in adoption of farm pond (n=140)

Sr. No.	Constraints	Respondent	
		Frequency	Percentage
1.	Farm pond sedimentation.	91	65.00
2.	Unaware about farm pond scheme.	18	12.85
3.	While site selection for construction of farm pond the expert from SAU's are not involved	04	02.85
4.	Difficulties in subsidy	41	29.28
5.	Rate of evapotranspiration was high in summer season	17	12.14
6.	Disturbances' of wild animals	54	38.57
7.	Electric load shedding	29	20.71
8.	Productive land goes under the construction of farm pond.	13	09.28

faced constraint such as farm pond sedimentation followed by the respondents who faced the constraints of disturbances of wild animals (38.57%), with regard to getting subsidy at proper time (29.28%) whereas the constraint of electric load shedding was faced by 20.71 per cent of the beneficiary farmers. The constraints such as unawareness about farm pond scheme among the farmers (12.85%) high rate of evapo-transpiration (12.14%), productive land goes under the construction of farm pond. (9.28%) were faced by the beneficiary farmers. Very few respondents (2.85%) faced the constraint improper site selection for construction of farm pond due to un involvement SAU's scientist.

Conclusion :

The implementation of farm pond programme needs to be continued and extend to other dryland areas and should motivate the farmers for fish rearing which may help the farmers to gain additional income. Secondly, the farmers are to be educated to go for high value and demand driven crops such as fruit,vegetables and floricultural crops in their production programme instead of low value crops as the protective irrigation facility is available. Further, it was also observed that most of the farmers were facing the constraints such as farm pond sedimentation and disturbances from wild animals, high rate of evapotranspiration during summer season. Therefore, it can be implicated that, government should include the cost in the subsidy (allotted during construction of farm ponds) required to remove sedimentation to the small and medium farmers and should also provide the fencing to prevent disturbances of wild animal and also increase the role of university scientist for awareness among the farmers regarding different schemes of farm ponds, scientific methods of controlling loss of water through evapotranspiration and also in site selection process for farm pond construction. State department of agriculture should also recommend that the farmer should build a community farm pond to control loss of productive land under construction of farm pond.

Authors' affiliations :

S.B. SHINDE, Department of Agricultural Extension, Post Graduate Institute, Mahatma Phule Krishi Vidyapeeth, Rahuri, AHMEDNAGAR (M.S.) INDIA

REFERENCES

Bagdi, G.L., Sharma, J.S. and Kumar, V. (2001).Adoption of soil and water conservation technologies by the farmers of Sardar Sarovar Project Catchment, Gujarat State.*Indian J. Soil Cons.* **29**(1) : 65-66.

Bhange, S.B., Lande, S.B. and Sadaphale, S.S. (2005). Impact of National Watershed Development Programme.*Asian J. Extn. Educ.*, **29** (1&2) : 62-65.

Desai, R. (2005). An economic analysis of rain water harvesting structure-A case study of farm ponds M.Sc. (Ag.) Thesis, University of Agricultural Sciences, Dharwad, KARNATAKA (INDIA).

Desai, Rajeshwari, Patil, B.L., Kunnal, L.B., Jayashree, H. and Basavaraj, H. (2007). Impact assessment of farm ponds in Dharwad district of Karnataka. *Karnataka J. Agric. Sci.*, **20** (2) : 426-427.