

Knowledge and Adoption in Use of Community Tanks in Vidarbha Horticulture

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ABSTRACT

Government has taken initiative in increasing scope for horticultural crops, medicinal crops and floriculture. There is wider scope and greater opportunities for horticultural crop production, processing and export. National Horticultural Mission emphasized on construction of common tank to meet the purpose as reservoir for storage of rain water. for more economic gain thereby bringing new revolution in fruit crop production. The rainwater management is the only viable solution to satisfy growing need of water. Extended educational network in rural area would benefit the changing scenario of water management. As learned farmers are more conscious, scientific and broad in thinking are ready to take risk with responsibilities.

A research study was therefore important to know present condition of the beneficiaries, their knowledge about community tank and difficulties faced by them in construction of community tank and its use. The study was confined to community tank beneficiaries with specific objectives to study the level of knowledge and adoption as well as relation between knowledge and adoption. Also, to test the difference in knowledge and adoption level.

Census method of sampling was used and 135 beneficiaries interviewed from the six districts formed the sample for study. Knowledge level of majority beneficiaries was excellent however lagging in technical knowledge. Non awareness of water losses was the reason for non adoption. Knowledge and adoption were positively correlated.

Keywords: Community tank, National Horticulture Mission, Socio-economic status.

INTRODUCTION

Water is life's matter and matrix, mother and medium. The rainwater management is the only viable solution for satisfying growing demand of water. The challenge before the Indian agriculture is to transform rainfed farming in to more sustainable and productive farming system through conservation and management of rainwater in rainfed areas.

Countries around the world are experiencing and growing crises of water scarcity. More than two billions people almost 30 per cent of the global population live in water scarce condition. The H₂O water network and H₂ON token strategy is designed to lower the barriers to deploy more water infrastructures quicker globally to unlock need, sources and approaches to water production (h20-securities.com).

Construction of community tank for storage of water by two or more beneficiaries with government aid for utilization of water to irrigate crop and utilization of community tank for fishery as

subsidiary occupation for increasing income of the growers is the innovative concept of community tank.

Maharashtra state has 76 lakhs hectares of land under irrigation. 149 lakh hectares area still need to be brought under irrigation. Govt. of Maharashtra is intensively trying for horticultural development since last 20 years. Efforts are being made to bring 29 lakh hectares fallow land under horticulture out of this 14 lakh hectares land has been brought under horticulture with the establishment of Maharashtra State Horticulture and Medicinal Plant Board (Desai, 2011).

For rising productivity as well as socio economic development by means of protective irrigation community tanks are highly beneficial (Satpute *et al.* 2010). The learned farmers are more scientifically oriented and ready to take risk and responsibilities. Till they need encouragement and technical guidance (Chitale, 2010).

Tanks constructed by villagers are the water bodies that collect and store monsoonal rain water

which is used as protective irrigation during dry period and also used for harbouring fish therefore tanks need to be included in an integrated water management policy (Neha Jain 2019).

While addressing the press and the media on topic "Scientific Agricultural Water Management : A pressing need for food safety" Dr Trilochan Mohapatra. Secretary (DARE) and DG (ICAR) emphasized on adopting the water storage and conservation practices by farming sector in order to deal with the challenges being posed to the ecosystem in the wake of climate change, drought and flood he stressed on adopting sustainable, smart, precision technologies of irrigation management as well as importance of storage and conservation of wastewater. He highlighted the various technologies developed by ICAR for water storage and conservation.

While stating the impact of protective irrigation harvesting of runoff from the cultivated field into farm pond and utilized to provide protective irrigation enhanced the crop yield and water use efficiency (Taley, 2016).

The Israel green development organization KKL-JNF constructed 230 reservoirs that stored treated wastewater for agriculture use. Every year these reservoirs add upwards of 260 Million cubic meters of water to Israel water economy. (Max Keplan - Zantopp- 2022).

South Africa as a water scare country with extreme climate, rainfall fluctuations and unevenly distributed water resources has invested in water storage in order to boost water availability for its socio-economic and environmental needs. Govt. of South Africa through Department of Water sanitation has increased its investment in the development of bulk raw water and water services infrastructures shows high human and macro-economic benefits and proved an indispensable tool for society. Water storage in all its forms play vital role for sustainable development and adaptation to climate change, to reduce climate vulnerability. Well planned and efficiently manage water storage infrastructures are important for the provision of safe and secure water supply to household, agriculture, industry and hydro power generation.

(Musendera and Atyosi, 2018).

Result of the study reports (Narayan Moorthy, 2022) on performance of tank irrigation in India Rayalseema region of Andhra Pradesh suggested that well structured water users organizations should be established for storage capacity and to take measures to improve the flow of water. They observed sharp reduction in area under tank irrigation in Andhra Pradesh state over the years.

Considering the increasing opportunity for horticultural crop production, processing and export to gain more income growing horticultural crops National Horticulture Mission focused and emphasized on construction of community tank for conservation and judicious use of water for crop cultivation.

The present study is an attempt to find out the problems in implementation of the scheme on construction of community tank and its utility to the beneficiaries. A research study was therefore important to know the present condition of beneficiaries, their knowledge about community tank, difficulty if any faced by them in construction of community tank and its use.

The present study is proposed with the objectives in mind as

Objectives

- 1) To study the level of knowledge amongst selected beneficiaries
- 2) To study the adoption amongst selected beneficiaries.
- 3) To study the relation between knowledge and adoption.
- 4) To test difference in knowledge and adoption level

METHODOLOGY

The research study area confined to six suicide prone districts of Vidarbha region of Maharashtra State namely, - Akola, Buldhana, Washim, Yavatmal, Amravati and Wardha covered under special Prime Minister Package for Horticulture and overall development. Census method was used for the study. All the community

tank beneficiaries farmers interviewed from six districts formed 135 samples for the study. Experimental design of social research was used which consist of before and after data.

Knowledge

Knowledge operationally defined as the know how possessed by the beneficiaries about guidelines of community tank construction as recommended by National Horticulture Mission. A knowledge schedule was developed for ascertaining the knowledge of beneficiaries about recommendations made by NHM for construction of community tank.

Knowledge schedule was developed carefully including 12 important practices about construction and use of community tank. The response to each question given by the beneficiaries were assigned with the score 1 and 0 for correct and incorrect answer respectively. The total knowledge score of beneficiaries was computed by summing all the correct replies. The knowledge index was worked out to measure knowledge by using following formula.

$$\text{Knowledge Index} = \frac{\text{Actual knowledge score}}{\text{Maximum possible score}} \times 100$$

On the basis of knowledge index the beneficiaries were categorized by equal interval method as under.

Adoption

Adoption refers to the putting into actual application of National Horticulture Mission guidelines related to community tank construction and its use.

There were 11 items related to selected techniques. The response in terms of adoption and non adoption was scored 1 and 0 respectively. The sum of all the responses was adoption score. Adoption was measured on the basis of adoption index with the help of following formula.

$$\text{Adoption index} = \frac{\text{Actual adoption score}}{\text{Maximum possible score}} \times 100$$

On the basis of adoption index, the adoption categories were formed by equal interval method and community tank beneficiaries were categorized into three groups as under.

RESULTS AND DISCUSSION

Knowledge

Knowledge had crucial role in adoption of an innovative idea of community tank. A knowledge schedule was developed and knowledge index was worked out for ascertaining knowledge of the beneficiaries about items of community tank construction made by National Horticulture Mission. Practicewise knowledge of beneficiaries about construction and use of community tank is presented in Table 1.

*Table 1
Practicewise knowledge of beneficiaries about construction and use of community tank*

Sl. No.	Practice	Beneficiaries (n=135)	
		No.	Percentage
1	Knowledge about official procedure for proposal of community tank	93	68.89
2	Norms for site selection of community tank	47	34.81
3	Precaution in site selection for community tank	51	37.78
4	Guidelines and quality of construction of community tank	114	84.44
5	Knowledge about dimensions of the community tank	132	97.78
6	Measures to be adopted to avoid percolation through flooring and walls/ bunds of community tank	134	99.26
7	Material to be used for lining	135	100.00
8	Measures to be adopted to resist evaporation loss of water in community tank	31	22.96
9	Geomembrane film parameters	34	25.18
10	Details importance of agreement	123	91.11
11	Irrigation management of water stored in community tank	132	97.78
12	Information to be displayed about community tank at the site	131	97.04

It is observed from Table1, that vast majority of respondents was having knowledge of Material to be used for lining (100%), Measures to be adopted to avoid percolation through flooring and walls/ bunds of community tank (99.26%), Knowledge about dimensions of the community tank (97.78%), Irrigation management of water stored in community tank (97.78%), Information to be displayed about community tank at the site (97.04%) and Guidelines and quality of construction of community tank (84.44%), majority of beneficiaries (68.89%) have knowledge about

official procedure for proposal of community tank.

However, the beneficiaries are still lacking in knowledge about norms for selection of site for community tank (34.81%), precaution in site selection (37.78%), measures to prevent evaporation losses of water in community tank (22.96%) and Geomembrane films parameters used for lining (25.18 %).

The beneficiaries were grouped into three categories viz. low, medium and high by equal interval method as shown in Table 1.

Table 2
Distribution of the beneficiaries according to knowledge level

Sl. No.	Knowledge level	Beneficiaries	
		No.	Percentage
1	Medium (33.34 to 66.66)	34	25.19
2	High (66.67 and above)	101	74.81
	Total	135	100.00
	Mean = 71.42		

It is evident form Table 2 that about 3/4th (74.81%) and quarter number (25.19%) beneficiaries had high level and medium level of knowledge, respectively. It was surprising to note that in low knowledge level category not a single beneficiaries appeared. Similar findings were reported earlier by Koshti *et al.* (2007).

Practicewise knowledge of beneficiaries about construction and use of community tank is presented in Table 2.

2) Adoption

Adoption schedule was developed and adoption index was worked out for accessing actual implementation of items recommended by National Horticulture Mission related to items of community tank construction and it's use.

Practicewise adoption of items of construction of community tanks was worked out and is presented in Table 3.

Table 3
Practicewise adoption of items of construction of community tank by beneficiaries

Sr. No.	Practices	Beneficiaries (n=135)	
		No.	Percentage
1	Factors considered for size of community tank	129	95.55
2	Site of community tank in farm	25	18.52
3	Precaution in site selection for construction of community tank	70	51.85
4	Measured adopted to protect evaporation losses of water stored in community tank	01	0.07
5	Measured followed to prevent percolation losses of water from community tank	135	100.00
6	Geomembrane film used for lining of community tank	135	100.00
7	Geomembrane film thickness of 500 micron used for community tank	91	67.41
8	ISI standard and geomembrane film used	112	82.96
9	Agreement for use of water in community tank	135	100.00
10	Use of notice board for display of information about community tank	133	98.52
11	Water management from community tank (Drip/ sprinkler irrigation)	126	93.93

From Table 3, it was observed that cent per cent beneficiaries made agreement for water use stored in community tank, used geomembrane film for lining in order to prevent percolation losses of water from community tank. Majority of the beneficiaries practiced use of notice board for display of information about community tank site (98.52%). They considered availability of water sources and land holding while deciding size of community tank (95.55 per cent). Also make use of drip/ sprinkler for irrigating water stored in community tank (93.33%), ISI standard geomembrane film was used for lining of community tank by (82.96%) and 500 micron geomembrane film used for lining by (67.41%) beneficiaries.

However, regarding site selection the

recommendation were followed by 18.52 per cent beneficiaries and remaining beneficiaries selected site as per their own convenience. Nearly half (51.85%) beneficiaries not taken much precaution while site selection for construction of community tank. Measures to protect evaporation losses of water stored in community tank was adopted by negligible amount i.e. 0.07 per cent beneficiaries.

Efforts are needed to disseminate information on technical aspects such as importance of site, parameters of site selection, material quality used for lining of community tank, measures to minimize evaporation losses of stored water in community tank amongst beneficiaries.

The beneficiaries were grouped into three categories viz. low, medium and high by equal interval method as shown in Table 4.

Table 4
Distribution of the beneficiaries according to adoption level

Sr. No.	Adoption level category	Beneficiaries	
		No.	Percentage
1	Medium (33.34 to 66.66)	40	29.63
2	High (66.67 and above)	95	70.37
	Total	135	100.00
	Mean = 73.00		

From Table 4, it is observed that beneficiaries appeared in medium and high adoption categories. The mean of adoption was found to be 73.00 per cent. Maximum number of

(70.37%) of the beneficiaries had high level of adoption followed by 29.63 per cent of the beneficiaries with medium level of adoption. Similar findings are reported by Jaiswal (2001).

Table 5
Relation between knowledge and adoption

Variable	Adoption (r value)
Knowledge	0.2619***

Knowledge established highly significant correlation (0.2619) with adoption of community tank. Knowledge about community tank guidelines recommended by NHM for its construction and

water use definitely makes aware about its benefits, naturally it motivates beneficiaries to adopt community tank.

Table 6
'Z' test for knowledge and adoption

	Knowledge	Adoption	'Z' value
Mean	71.42	73.00	N.S.
S.D.	11.54	11.71	0.98 ^{NS}

Non significant of 'Z' value concludes that knowledge and adoption are equally associated variables. Levels of knowledge and adoption are equal.

CONCLUSIONS

The knowledge level of the beneficiaries about knowledge of general aspects of community tank construction as per the guidelines by NHM and its use was excellent and satisfactory. This might be due to higher education, socio-economic status, scientific orientation and attitude towards community tank. However, the community tank beneficiaries were lacking and poor in technical aspects to overcome this proper guidance should be imparted through training.

Higher adoption of community tank recommendations by NHM might be due to higher education, better economic standing leading towards more scientific orientation and knowledge acquisition and highly convinced and understood the benefits of water use and importance of community tank.

Lack of knowledge and awareness about preventive measures against evaporation losses might be the reason for non adoption of measures against evaporation losses. Knowledge and adoption were positively correlated. Knowledge and adoption level were at par of community tank beneficiaries.

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