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IMPACT OF FARM PONDS ON AGRICULTURE - A CASE STUDY OF PARNER TEHSIL

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Abstract -

Water is the life for human beings and for the entire creatures on the Earth, The Earth itself has a special value because it is the only planet bearing the Water in our Solar System. All of us need water for our livelihood, Agriculture can't sustain without water. As the Human population increasing at unprecedented rate we have to use water cautiously. It is said that next world war can take place because of water. The climate is changing drastically for past two decades, as we have seen more whimsical precipitation and its spatio – temporal Pattern, In India still more than half of its population depends on Agriculture for their livelihood. Agriculture is still the backbone of India's Economy. Monsoon is the only source of water in India. Indian economy still comes in trouble if the Monsoon period goes rainless. . Often, large amounts of rainfall are received but in a very short span of time, leaving the rest of the year dry. Reduced rainfall or prolonged dry spells often lead to crop failure. Poor landless laborers and small farmers struggling to cultivate crops and raise livestock are further pushed into poverty by irregular rainfall, recurrent drought and soil degradation, often forced to migrate to urban centers in search of employment, The farm ponds play a key role in agriculture. Best utilization of water is done by many methods, Construction of Farm Ponds is one of the best method among them. In this paper an attempt has been made to explain structure and storage capacity, utilization , Cropping Pattern and importance of farm ponds in Parner Tahsil of Ahmednagar District.

Keywords: - Farm Ponds, Agriculture, Cropping Pattern

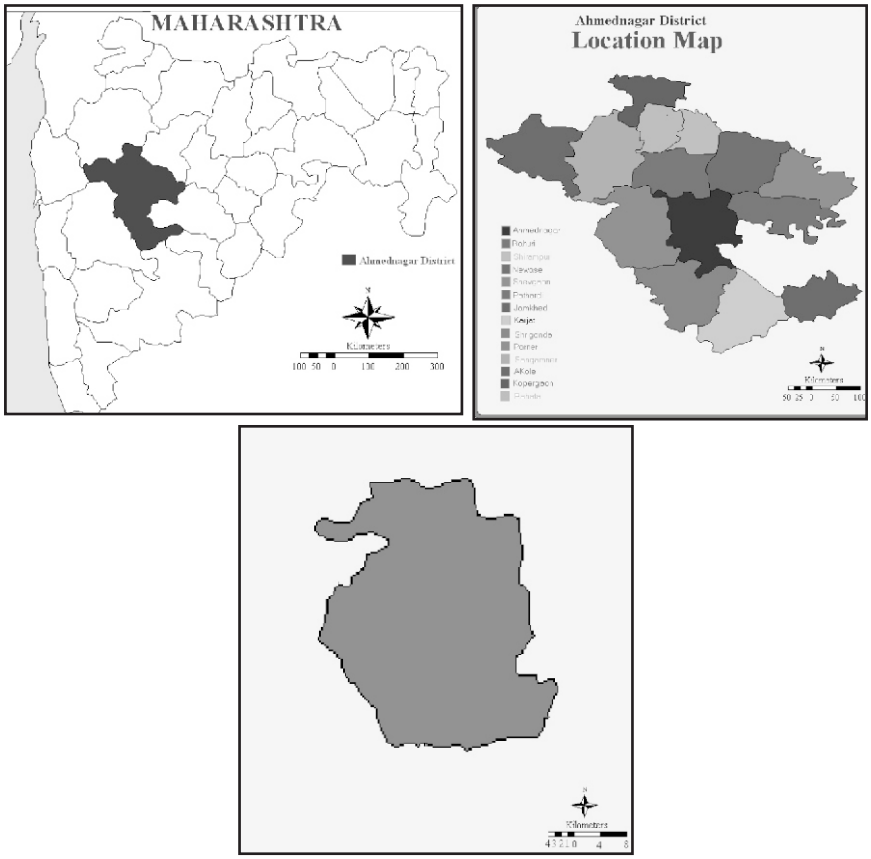
Introduction:

A farm pond is a large hole dug out in the earth, usually square or rectangular in shape, which harvests rainwater and stores it for future use. Ahmednagar district is a draught prone area which receives scanty rainfall. Parner Tehasil is absolutely draught prone tehsil.

Study Area :

Ahmednagar district is largest district of state in area and Parner tahsil is located in Ahmednagar district. Town of Parner is located at coordinates 18o 49' 40" North, 19° 21' 13" North Latitude, and 740 10' 22" E to 740 38' 34" East longitude at an altitude of about 790 metres Centrally located in the of map of State of Maharashtra, geographically enjoys its prominent place .Towards the East of the tahsil Ahmednagar and shrigona tehsil. Towards the West there is Pune Tahsil; while towards the North it is attached to Sangamner , and towards the South there is Shirur tehsil. The total number of villages are 131. Maximum temperature of the tahsil is 40 degree Celsius and the minimum temperature is 14 Degree Celsius. Average rainfall is 486.9 mm. Rainfall generally received in the months from June to October of the year. Total Area of Parner Tehsil is 164679.5 square kilometer. Total Agriculture Land in the Parner tehsil is- 147763 Hectors, in which total Forested Land is 18792 Hectors, , Total Population of the tehsil is 2,46,535, Male 1,23,902, Female- 1,22,633 Sex Ratio of total- 990, Literates Total- 1,53,625, Male - 89,698,Female - 63,927, Total Farmers in the Tehsil are 63,752, (Source - Census – 2011),

Location Map -



3) Objectives:-

3.1. To assess the structure and storage capacity of Farm Ponds in Parner tahsil.
3.2 To study the usefulness of Farm Ponds in Parner tahsil.
3.3. To Study the changing cropping pattern in Parner, after constructions of Farm ponds.

4) Methodology

Methodology provides insight into the source of data, methods of obtaining data, selection of time period, variables chosen and analytical tools deployed for analysis of data to accomplish objectives of study.

4.1 Basic Approach of the study =

The study is intended to know the performance of the farm Pond Scheme in the selected area. The attempt is made to identify the benefits, losses and problems of the implementation of the Farm Pond scheme. For this, the data are simply analyzed, presented and discussed.

4.2 Sources of Data =

The data is collected from primary and secondary sources.

4.2.1 Primary Data =

The primary data is collected from the farm pond beneficiary farmers of the selected villages in the Tehsil, the specially designed questionnaire is used for Collection of Data.

4.2.2. Secondary Data. =

Secondary data is collected from the published sources like Economic Survey, Agriculture Department, Statistical abstract etc. for the supporting the results of the present study. The secondary data figures provide the guideline and insight for planning and implementing work.

4.2.3 Sampling Technique =

From the total number of 931 farm ponds from parner tehsil, 10 percent farm ponds are covered for the study, i.e. 95 questionnaires were filled. The study is carried out evenly and not concentrated in any one part of the tehsil. The study was carried in a way to insure that all of the villages are represented in the study, thus stratified sampling techniques is used for obtaining the data for survey.

Structure of Farm Ponds -

The selection of a site for a farm pond is critical in maximizing its storage capacity. The pond must be located in a corner of a plot of land so that it does not disturb farm operations like plowing. It must be located at least 3m away from other farmers' fields common lands. The slope of the land and the slope's direction must also be carefully evaluated.

Excavation

A test pit is dug out before finalizing the location and depth of excavation. The excavation and transportation of earth can be accomplished with a combination of manual labour or with machines like excavators and tractors.

Diagram Showing the Structure of the Ideal farm pond –

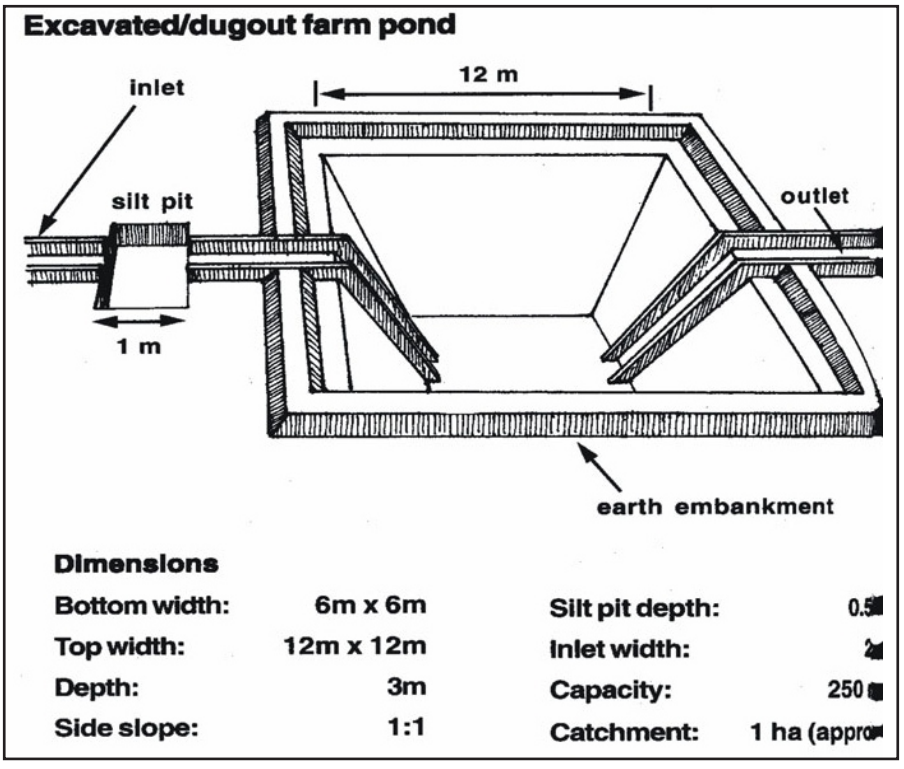


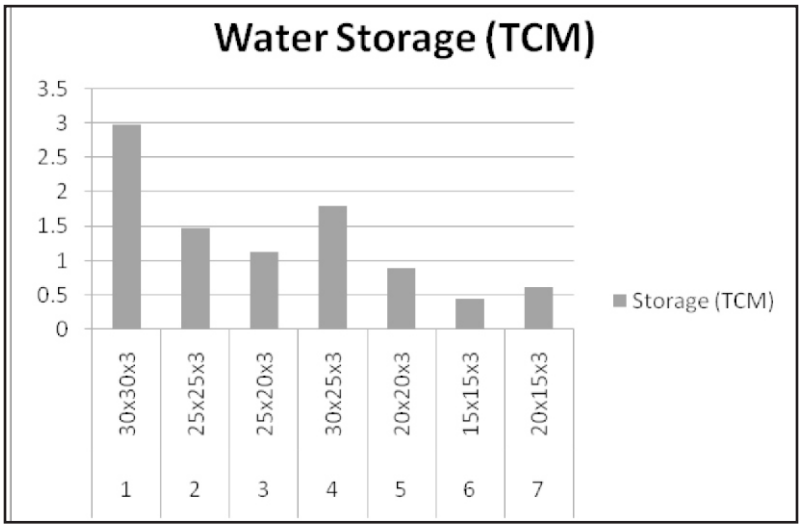
Table No .1
Water storage Capacity according to size of Farm ponds

Sr no.	Size in meter	Storage Capacity (TCM)
1	**20x20x3**	**0.876**
2	**20x20x2**	**0.651**
3	**20x15x3**	**0.621**
4	**20x15x2**	**0.471**
5	**15x15x3**	**0.441**
6	**15x15x2**	**0.341**
7	**15x10x3**	**0.261**
8	**15x10x2**	**0.21**
9	**10x10x3**	**0.156**
10	**25x20x3**	**1.131**
11	**25x25x3**	**1.368**
12	**30x25x3**	**1.631**
13	**30x30x3**	**1.886**

Source - Panlot Kshetra Vikas Margadarshika (Govt. of Maharashta) Edition - 2003, PP – 246

Table No. 2 Total Number and water Storage Capacity of Farm Ponds in Parner Tehsil

Sr No.	Size of Farm Ponds	Storage (TCM)	Number of Farm Ponds	Total Storage (TCM)
1	**30x30x3**	2.97	802	1761.19
2	**25x25x3**	1.46	28	40.91
3	**25x20x3**	1.13	19	21.49
4	**30x25x3**	1.79	15	26.86
5	**20x20x3**	0.88	48	42.05
6	**15x15x3**	0.44	17	7.50
7	**20x15x3**	0.62	06	3.73
	Total		**935**	**1903.73 TCM**



TCM = Thousand Cubic Meter.

Discussion

It is observed that in the Parner tehsil total of 935 farm ponds were constructed. The preferred size of the farm pond is 30x30x3, which can store 2.97 TCM of Water, it means that total of 1761.19 TCM of water is stored in of 30x30x3. If all the water storage of different size of farm pond is calculated for Parner tehsil it is clear that total of 1903.73 TCM of water is stored in Parner Tehsil alone. This means that 1.90 TMC water is stored in Parner Tehsil. The farm ponds helped for the purpose of supplemental irrigation for the horticulture in the Tehsil, and proved to be useful for the ground water recharge. It can be concluded from above discussion that huge quantity of water can be stored in the farm ponds.

Based on 10 % Sample Study of Parner Tahesil

Table No. 3 Size of Farm Ponds

Sr No.	Size of Farm Ponds	Number of Ponds
1	30x30x3	75
2	25x25x3	7
3	25x20x3	5
4	30x25x3	3
5	20x20x3	2
6	15x15x3	2
7	20x15x3	1
	Total	**95**

Among the studied farm pond structures in the study area, majority of farm ponds is of 30x30x3

structure. It is the most preferred structure among the farmers. Total of 32 farm ponds among the 75 were of 30x30x3, 3 farm ponds were of 30x25x3 structure, 2 farm ponds were of 20x20x3, 1 were of 20x15x3, 2 farm ponds were of 15x15x3, 7 farm pond were of 25x25x3 and 5 farm ponds were of 25x20x3.

Table No 4 Water Storage Capacity –

Sr No.	Structure of Farm Ponds	Water Stored in TCM
1	**30x30x3**	164.7
2	**25x25x3**	10.23
3	**25x20x3**	5.66
4	**30x2 5x3**	5.37
5	**20x20x3**	1.75
6	**15x15x3**	0.88
7	**20x15x3**	0.62
	Total	189.21

The capacity of water in the farm pond is crucial for the farmers, in the size of 30x30x3, total of 164.7 TCM water can be stored, 30x25x3 can store 5.373 TCM water, The size of 25x25x3 can store 10.227 TCM of water , The size of 20x15x3 can store water of 0.621 TCM, The size of 20x20x3 can store water of 1.752 TCM, The size of 20x25x3 can store water of 5.655 TCM and The size of 15x15x3 can store water of 0.882 TCM,

Hence the total water stored in studied farm ponds were 189.21 TCM , i.e 0.19 TMC of water is stored in the total studied 95 farm ponds.

1) Utilization of Farm Ponds –

It is observed that Farm ponds were used for variety of purpose by the farmers. From agriculture to household chores. Majority of farmers were using the water in farm ponds for crops and horticulture through micro irrigation, water is also being used for poultry farms , and for other livestock's.

2) Cropping Pattern Past and Present Situation –

In the absence of Farm ponds it is observed that most of the farmers relied more on the crops which required less water, before the construction of farm ponds majority of farmers where taking jowar crop as the main crop in Rabbi period, and Bajara as a major crop in Kharip season. The situation changed after the introduction of farm ponds, farmers started to take onion as a major crop in Rabbi season, which is more economically profitable crop than the jowar, similarly in Kharip season too farmers are taking onion as the main crop, along with the introduction of new crop can be seen, i.e. Tomato, Sugarcane , Watermelon, Green chillies, and grasses for live stocks and horticulture etc. hence it is clear that Farm Ponds played a major role in the life of these farmers, they are now getting good returns from their farms.

Conclusion -

The given study area is the rain shadow region of Maharashtra, amount of rainfall is negligible in this region and agriculture is the major activity. It is proved that Farm ponds useful for water conservation and leads to area increased under irrigation. It is very clear that farm ponds are the life changing factor for many farmers in the Parner Tahesil, The farmers from the study area getting benefit from the micro irrigation with the help of farm ponds for their agriculture products like

horticulture, floriculture and other cash crops.

References –

· Sandeep Khanwalkar 2010, Madhya Pradesh Rural Livelihoods Project (MPRLP), Bhopal, Madhya Pradesh Rainwater Harvesting through Farm pond and Well Recharging Structures to Support Rainfed Agriculture, Rainwater Harvesting and Reuse through Farm Ponds Experiences, Issues and Strategies Proceedings of National Workshop-cum-Brain Storming 21-22 April 2009 CRIDA, Hyderabad Editors K.V. Rao, B.Venkateswarlu, K.L. Sahrawath, S.P. Wani, P.K. Mishra, S.Dixit, K. Srinivasa Reddy, Manoranjan Kumar and U.S. Saikia CRIDA, p.p.3-13)

· M. Dinesh Kumar 2010. Water Harvesting Structures in Naturally Water Scarce Regions: Hydrological Opportunity and Economic Viability Institute for Resource Analysis and Policy, Hyderabad, Rainwater Harvesting and Reuse through Farm Ponds Experiences, Issues and Strategies Proceedings of National Workshop-cum-Brain Storming 21-22 April 2009 CRIDA, Hyderabad Editors K.V. Rao, B.Venkateswarlu, K.L. Sahrawath, S.P. Wani, P.K. Mishra, S.Dixit, K. Srinivasa Reddy, Manoranjan Kumar and U.S. Saikia CRIDA, p.p.-14-23)

· BL Deopura and BR Chahar 2010, Department of Textile Technology and Department of Civil Engineering Indian Institute of Technology (IIT) New Delhi, Rainwater Harvesting and Reuse through Farm Ponds Experiences, Issues and Strategies Proceedings of National Workshop-cum-Brain Storming 21-22 April 2009 CRIDA, Hyderabad Editors K.V. Rao, B.Venkateswarlu, K.L. Sahrawath, S.P. Wani, P.K. Mishra, S.Dixit, K. Srinivasa Reddy, Manoranjan Kumar and U.S. Saikia CRIDA, Pp-26-28

· RK Goyal, 2010 ,Rainwater Harvesting: A Key to Survival in Hot Arid Zone of Rajasthan Rainwater Harvesting and Reuse through Farm Ponds Experiences, Issues and Strategies Proceedings of National Workshop-cum-Brain Storming 21-22 April 2009 CRIDA, Hyderabad Editors K.V. Rao, B.Venkateswarlu, K.L. Sahrawath, S.P. Wani, P.K. Mishra, S.Dixit, K. Srinivasa Reddy, Manoranjan Kumar and U.S. Saikia CRIDA, PP. 29-38)

MG Shinde, SD Gorantiwar and IK Smout-2010, Optimum Design of Watershed Based Tank System for Semiarid and Sub-humid Tropics Rainwater Harvesting and Reuse through Farm Ponds Experiences, Issues and Strategies Proceedings

· Agriculture Department Parner Tehsil, Dist- Ahmednagar.

· Geography of Maharashtra – B. Arunachalam

· Government of India , Census 2011

· Impact Assessement Study Of Farm In 12 Districts Of Nashik, Pune Kolhapur And Aurangabad Divisions Of Maharashtra, Afc India Ltd. March 2014

· Mrudh Gandha, Government Of Maharashtra

· Panlot Kshetra Vikas Margadarshika (Govt. of Maharashta) Edition - 2003, PP – 246

· Rain Water Harwesting And Reuse Through Farm Pond , proceeding , CRIDA Central Research Institute For Dry Land Agriculture Hydrabad A.P.2010

· Socio Economic Abstract , 2011, Ahmednagar District.

· Watershed Development Guide, Water Conservation and Agriculture Development Maharahtra.

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