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DIFFUSION TREND OF FARM POND TECHNIQUE IN UPPER KRISHNA BASIN OF MAHARASHTRA: A GEOGRAPHICAL STUDY

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Abstract:

Agriculture plays vital role in the economic development of India. Agriculture is one of the strong holds of the Indian economy and accounts for 18.5 per cent of the country's gross domestic product (GDP). The innovative ideas like use of mechanical equipments, use of chemical and organic fertilizers, and use of modern irrigation techniques and their implementation are played a significant role for the production of various crops. The climatic disturbances like drought in the eastern tahsils leads serious problem of scarcity of water for agricultural activity. The innovative farmers in the region have adopted new techniques as solution for this problem. In eastern part of the region the farmers have accepted the water bank technique for grapevine cultivation and also for horticulture like banana and pomegranate. To meeting the demand of the water for whole year the farmers have collected the water from various sources and they store this water in the tanks constructed in their farms under various schemes provided by the government. Present paper aims to study the diffusion of farm pond technique in the region by using secondary data collected through district agricultural offices. The trend of adoption of the farm pond technique is represented through line graphs. It observed that this technique is accepted by the farmers those who are practiced grapevine cultivation and horticulture in the region.

Key words: Diffusion, Water bank, Farm Pond, Innovation, Agriculture, Horticulture.

1.1 Introduction:

Diffusion is the process of spread of any item in the space. The process of agricultural diffusion is the spread of new varieties of seeds and implements in space over time (Kushire 1989). In agricultural activity the diffusion of the innovative ideas of agricultural practices played an important role. The adoption of appropriate innovations is an important issue in agricultural development (Carolina Oleas and et.al. 2010). The innovative ideas like use of mechanical equipments, use of chemical and organic fertilizers, and use of modern irrigation techniques and implementation of cultural ideas are played a significant role for the production of various crops from the agricultural land. All these elements together form a developed kind of agricultural landscape. These elements are also provides new horizon for the agricultural development in the region.

The innovative ideas played significant role in agricultural development of the region. The farmers in the region have used various kinds of the innovative techniques for agricultural practices. The climatic disturbances like drought and scarcity of water is serious in the eastern tahsils of the region. To meeting the demand of the water for whole year the farmers have collected the water from various sources and they store this water in the tanks constructed in their farms. This stored water is properly utilized by using irrigation techniques like drip and sprinkler irrigation methods. The central government

and ministry of agriculture provide financial assistance to the farmers for construction of the farm ponds in their fields. The government provides financial support to the farmers through *"Rashtriya Krishi Vikas Yojana",* (RKVY), "*Maharashtra Rural Employment Guaranty Scheme*" (MREGS), *"Samuhik Shet Tali"* under *"National Horticulture Mission"* (NHM). In eastern part of the region most of the farmers applied these schemes for grapevine and also for horticulture. Hence here an attempt is made to analyze the trend of diffusion of farm pond technique in the region.

1.2 Objective:

To study, the Diffusion Trend of Farm Pond Technique as innovative idea for agricultural practice in the region.

1.3 Data base and Methodology:

The relevant secondary information and statistical data regarding of farm pond is collected through Director of Agriculture of Sangli, Satara and Kolhapur District for the period from 2005-06 to 2012-13. The said data is represented with the help of graphs for the detailed analysis.

1.4 The Region:

The Upper Krishna Basin of Maharashtra is selected as a study region for present investigation. It 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 persons (2011) which 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 (Fig 1.1). It includes whole Kolhapur, parts of Satara excluding tahsils like Man, Phaltan, Khandala and parts of Sangli districts excluding tahsils Jjath and Atpadi. The river Krishna flows for a distance of about 364 kms. and its total course of 1280 kms. River Krishna flowing almost parallel or sub parallel to Sahyadris it collects a large number of tributaries like Panchganga, Warna, Koyana, Hiranyakeshi, Vedganga, Dudhganga, Tarli, Urmodi, Venna and Yerala are important (Fig 2.4a). They making silt covered fertile plain. Krishna River is the earliest in the state to be harnessed for irrigation. The annual minimum and maximum temperature ranges between 13.3^0 C and 38.3^0C respectively. The maximum rainfall was recorded in Gaganbavada (5875 mm.) and minimum in Shirol (480 mm.) tahsils for the period of 2009-10. The lowest rainfall is recorded between 500 mm to 1000 mm. in Hatkangale, followed by Gadhahingalaj, Karveer, Wai, Kagal, Koregaon, Karad, Walawa, Khanapur, Miraj, Tasgaon, Kavatemahnkal, Kadegaon, Palus, Khatav and Shirol tahsils in the eastern part of the region. This motivates farmers for diffusion and its adoption of agricultural innovations in the region.

1.5 Farm Pond Technique:

Irrigation techniques meet the demand of water supply to the agricultural crops which is the basic requirement for the agricultural development. The various sources of the irrigation are available in the region. But the climatic disturbances and physiography of the region are directly affecting on the distribution of the irrigation sources. Farm pond is a dug out structure with definite shape and size having proper inlet and outlet structure for collecting the surface runoff flowing from the farm area. It is one of the most important rain water harvesting structure constructed at the lowest portion of the farm area. The stored water must be used for irrigation only (Reddy & Rao 2012). Mainly the drought prone regions in Maharashtra suffering the problem of scarcity and erratic nature of the monsoon create challenges before the farmers. This technique of farm pond provides stored water for the irrigation purpose. The government has given subsidy for the farmers for construction of the farm ponds in their farms.

The requirement of the water requires conserving the water by various methods like farm ponds, recharging structure open well, field bonding, division drain to collect more water in farm ponds and open well (Khanwalkar 2010). Such water collected in farm ponds is utilized for various crops in commercial farming system through water saving methods. The drip irrigation technique is used effectively for all the crops cultivated on the basis of farm pond. In Upper Krishna Basin after the drought of 2001-04 government has launched the programme for collection of water from surface runoff through farm pond technique. At the beginning these farm ponds are used only for percolation of the water and for enhancing the ground water recharge. But after the experience and due to the erratic nature of monsoon the farmers used silpoline paper for prevent water percolation. Now the government of Maharashtra also supports the financial assistance for the feeling the silpoline paper in the farm pond. The government provides subsidy to the farmers for dogging out the farm pond in their farms under programs like NHM, RKVY and MREGS. Here an attempt is made to study the trend of diffusion of farm pond technique in the region under various programs.

1.6 Trend of Diffusion of Farm Pond:

The region has about 5893 farm ponds under various schemes. It is observed that, trend of diffusion of farm pond is decreased tremendously in year 2008-09. In this year the drought like situation is becomes critical. In year of 2009-10 about 2300 farms are constructed by the farmers in their farms with the financial support of the government. The trend of adoption and its diffusion shows that, the number of ponds in the year 2009-10 was increased because the RKVY is launched and about 50 per cent of the farms are constructed in that year. After the year 2010-11 and 2011-12 the trend of farm pond is decreased up to 2001 farm ponds (Fig 1.2) The moving average of the trend shows that, 2010-11 is the year which shows highest cumulative number of ponds. This trend is decreased again in next year. The farm ponds contributed by various schemes are shown by the trend graph in fig 4.1and the analysis is elaborated here as under.

1.6.1 R. K. V. Y.:

The National Agricultural Development Programme (NADP) is also called as *"Rashtriya Krishi Vikas Yojana"* (RKVY). This scheme is launched in August 2007 as a part of 11th five year plan by government of India. The scheme covers all sectors such as crop cultivation, Horticulture, Animal Husbandry, Fishery, Education, Forestry and wildlife, Plantation and Agricultural Marketing, Food Storage and Warehousing, Soil and water Conservation. The special schemes for the construction of farm pond are launched by the government in drought prone region of the country. Under this programme about 3533 ponds are constructed for development of the agricultural area in the region. The programme implementation under this scheme was started in year 2009-10. During this year about 1496 ponds are constructed as farm ponds for agricultural purpose. In the year 2010-11 about 1594 ponds, whereas 311 farm ponds in 2011-12 and 132 in 2012-13 are constructed (Fig. 1.3). The trend of diffusion of farm pond in the region shows above 1400 and in year 2009 which decreased up to 132 farm ponds in 2012-13 which is decreased in the region.

1.6.2. M.R.E.G.S.:

The scheme is introduced as "*Maharashtra Rural Employment Guaranty Scheme*". The government gives financial assistance to construction of the farm ponds in agricultural land. Under this scheme about 753 farm ponds was constructed in year 2005-06, there are about 53 additional ponds were constructed in 2007 - 08, no additional ponds are constructed in 2006 and 2008-09. There are about 691 farm ponds are constructed in 2009-10 and 395 ponds are constructed in 2010-11 in the region (Fig.1.4). Such a scheme provides financial assistance to the farmers for construction of pond in their agricultural

farm by providing employment to the rural peoples in drought prone region. The trend of the farm ponds under this scheme is again declined after 2011-12 and shows the negative growth of the diffusion.

1.6.3 N. H. M.:

The scheme *"National Horticulture Mission"* was launched in 2005-06 as centrally sponsored scheme to promote holistic growth of the horticulture sector through an area based regionally differentiated strategies. This scheme is launched by the central government, Directorate of Agriculture; National Horticulture Mission provides assistance for area expansion, rejuvenation, Post Harvest Marketing and Processing, Human Resource Development (HRD) etc. Under this scheme government provides financial assistance for development of horticulture. The government provides 100 per cent assistance to the farmers for construction of farm pond. The trend of diffusion of farm ponds under the national horticultural mission shows the fast spread of the farm pond in 2006-07. There are about 177 farm ponds are completed in 2006-07 whereas about 113 farm ponds are constructed in 2009-10 in the region under this scheme. The trend of diffusion of farm ponds under NHM is again declined steadily up to 2010-11 and increased slowly in 2011-12 (Fig.1.5). The farm pond constructed under the scheme of NHM is also considered as community farm ponds. The farmers of nearby areas are comes together and they make proposal for the NHM farm pond. The government provides the financial assistance to construction of the ponds and also for filling the polythene paper in the pond. The quantity of the number of ponds is very few as compared to the ponds constructed under other schemes. The area under the farm pond and water storage capacity and the number of benefited farmers are large in number.

1.6.4 Farm Ponds and Area under Various Crops.

Grapevine is the major crop which covers 972 acres of area and about 24.74 per cent of respondents are used this technique. In western tahsils like Tasgaon, Khanapur and Kavthemahankal are famous for the grapevine cultivation. Pomegranate is second crop covers 325 acres of area and about 21.35 per cent of the respondents are used farm pond technique. The irrigated area by the farm pond of pomegranate followed by 97 acres of Banana, 85 acres of Mango, 32 acres of Sugarcane and 19 acres of Ginger. In region the eastern part has dominance of grapevine followed by pomegranate, Banana, Mango, Floriculture. The sugarcane is the other crop irrigated by the farmers on the basis of farm pond through drip irrigation (Fig. 1.6).

1.9 Conclusion:

In general the rate of diffusion of farm pond is started after drought like situation of 2001-04. It is increased after 2004 and observed the continuous diffusion and adoption of farm pond in the region. The rate of adoption of farm pond is slow in western hilly area and very low in central part of the region due to abundant water sources by the river Krishna and Panchganga. The eastern part of the scarcity zone has dominance in grapevine cultivation used drip irrigation technique in the study region. The grape cultivation needs water according growing stages. The farmers in the eastern tahsils suffering the scarcity of rainfall, so these farmers utilized the farm pond technique as *'Sanjivani'* for grapevine cultivation. The large number of farmers of eastern part of the region has adopted the farm pond technique. The drought is the natural hazard considered as barrier of agricultural development. But here it becomes carriers for the adoption of farm pond technique. The north eastern and eastern tahsils suffering the problem of scarcity of rainfall and also suffers the impact of drought. The erratic nature of the monsoon badly affects on the agricultural activity. So the farmers of the drought region are used the farm ponds for collecting the surface runoff water. They used this water for throughout the year gives good results to the farmer's so they adopted farm pond as an innovative technique. In future for development of the agriculture in the draught prohene areas needs to strengthen this innovative idea for commercial agriculture in the region itself and also in the country.

REFERENCES:

1. Government of India, (2007): "Guidelines for National Agriculture development Programme (NADP), "*Rashtriya Krishi Vikas Yojana*", Department of Agriculture and Cooperation, Ministry of Agriculture.
2. Government of India, (2007): "*Rashtriya Krishi Vikas Yojana*",(RKVY), Operational Guideline for XII five year plan, Department of Agriculture and Cooperation, Ministry of Agriculture.
3. Government of Maharashtra, (2005 to 2012): Office record for Farm Pond, in Sangli, District, Divisional Director of Agricultural, Sangli District.
4. Government of Maharashtra, (2005-06 to 2012): Office record for Farm Pond, in Satara, District, Divisional Director of Agricultural, Satara District.
5. Government of Maharashtra, (2008 to 2012): Office record for Farm Pond, in Kolhapur, District, Divisional Director of Agricultural, Kolhapur District.
6. Government of Maharashtra, (2011-12): Office record for Organic Farming, in Kolhapur, District, Divisional Director of Agricultural, Kolhapur District.
7. Khanwalkar, Sandeep (2010): "Rainwater Harvesting through Farm Pond and Well Reaching Structures to Support Rainfid Agriculture, Presiding of National Workshop cum Brain Storming CRIDA, Hyderabad.
8. Reddy, K. S., Kumar, Rao(2012): " Farm Ponds: A Climatic Resilient technology For rain fid Agriculture, Planning Design and Construction, Central Research Institute for Drayland Agriculture, Hyderabad, India
9. Kushire K. S. (1989): "Diffusion of Agricultural Innovations in Walwa tahsil of Sangli District (Maharashtra)", unpublished dissertation Submitted to the Shivaji University, Kolhapur for Degree of Master of Philosophy in Geography.
10. Carolina Oleas, Kim E. Dooley, Glen C. Shinn, Cecilia Giusti (2010): A Case Study of the Diffusion of Agricultural Innovations in Chimaltenango, Guatemala, Journal of International Agricultural and Extension Education, Volume 17, Number 2.

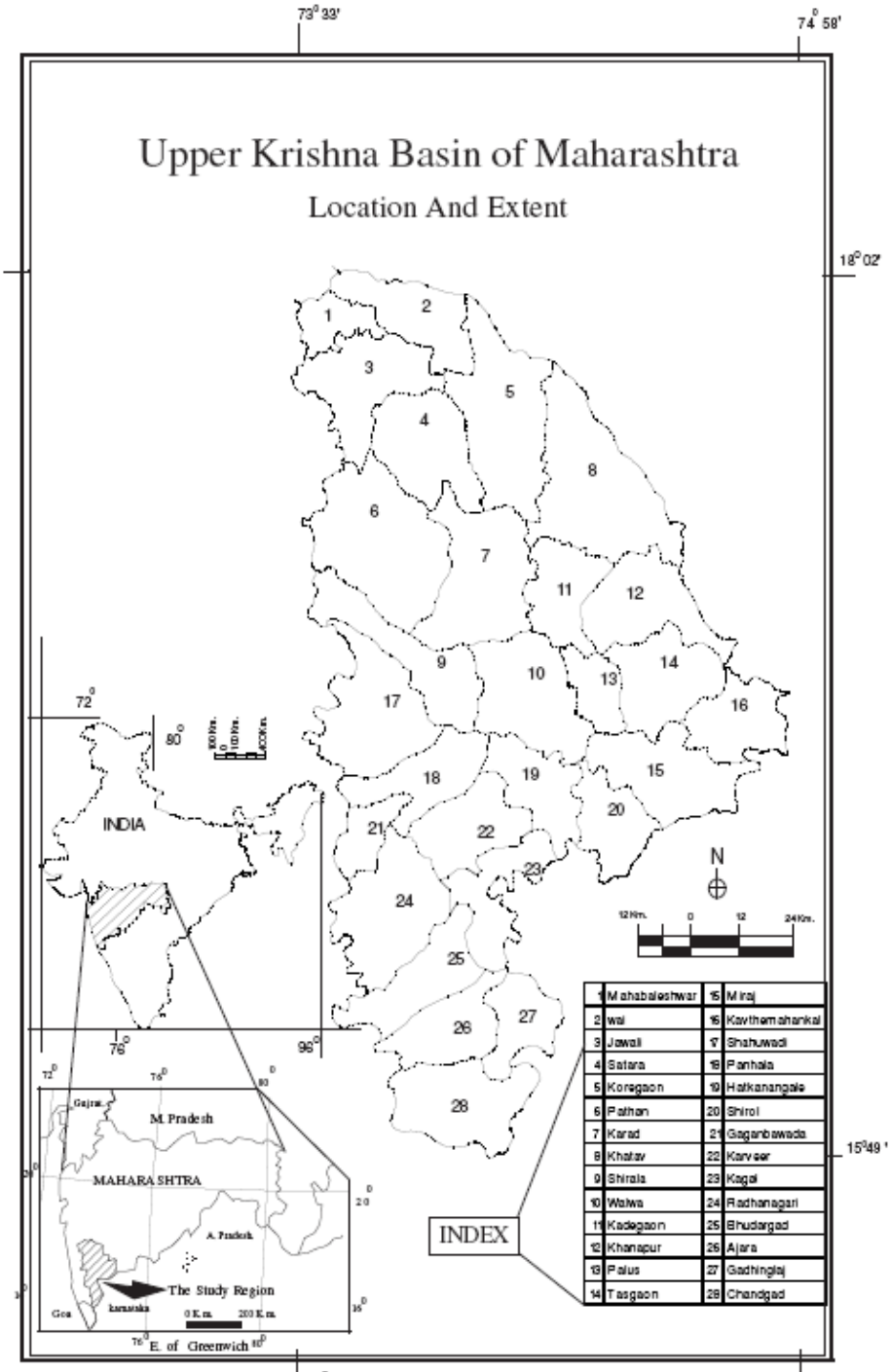
Upper Krishna Basin of Maharashtra
Location And Extent
73° 33'
74° 58'
18° 02'
15°49'
INDIA
MAHARASHTRA
M. Pradesh
A. Pradesh
Gujrat
Goa
Karnataka
The Study Region
E. of Greenwich
INDEX
1 Mahabaleshwar
2 wai
3 Jawali
4 Satara
5 Koregaon
6 Patan
7 Karad
8 Khatav
9 Shirala
10 Walwa
11 Kadegaon
12 Khanapur
13 Palus
14 Tasgaon
15 Miraj
16 Kavthemahankal
17 Shahuwadi
18 Panhala
19 Hatkanangale
20 Shirol
21 Gaganbawada
22 Karveer
23 Kagal
24 Radhanagari
25 Bhudargad
26 Ajara
27 Gadhinglaj
28 Chandgad

Fig 2.1

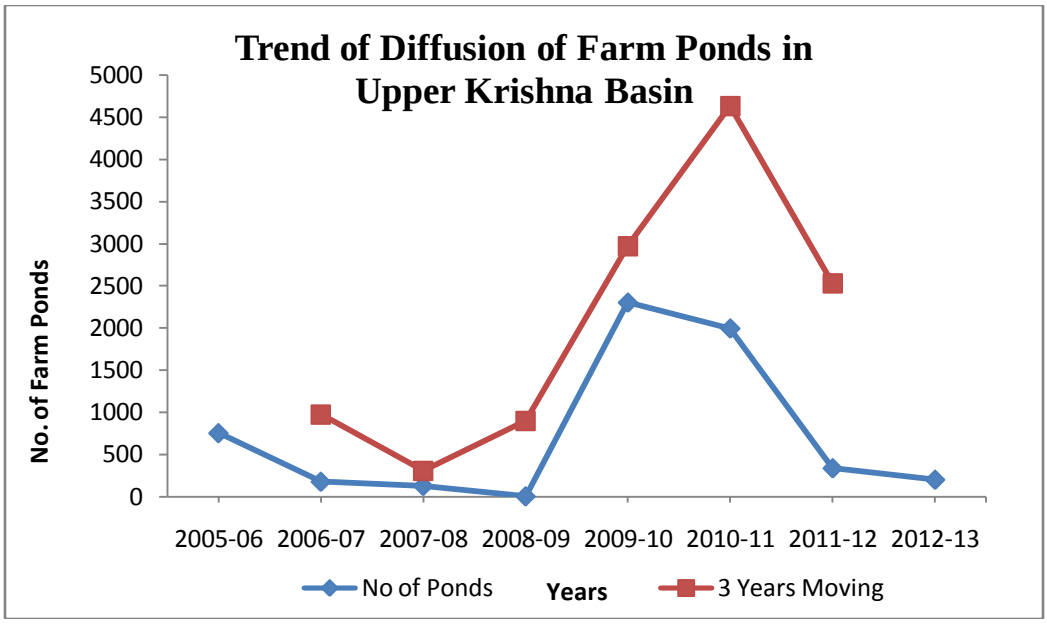

Fig.1.2

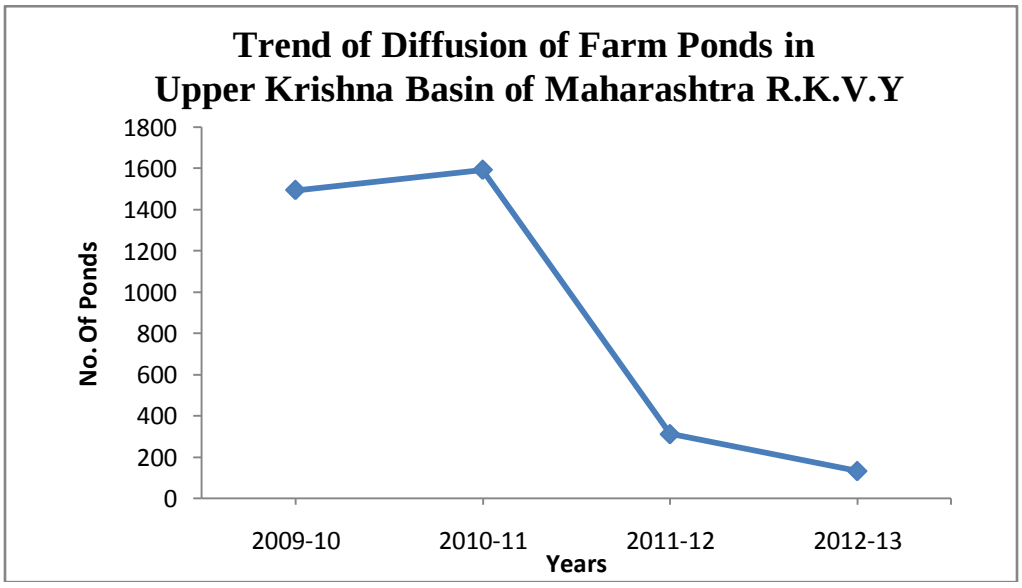

Fig. 1.3

Source: Data Compiled by Researcher through Socio Economic Abstracts of Sangli Satara and Kolhapur District 2007 -08 and 2011-12. And

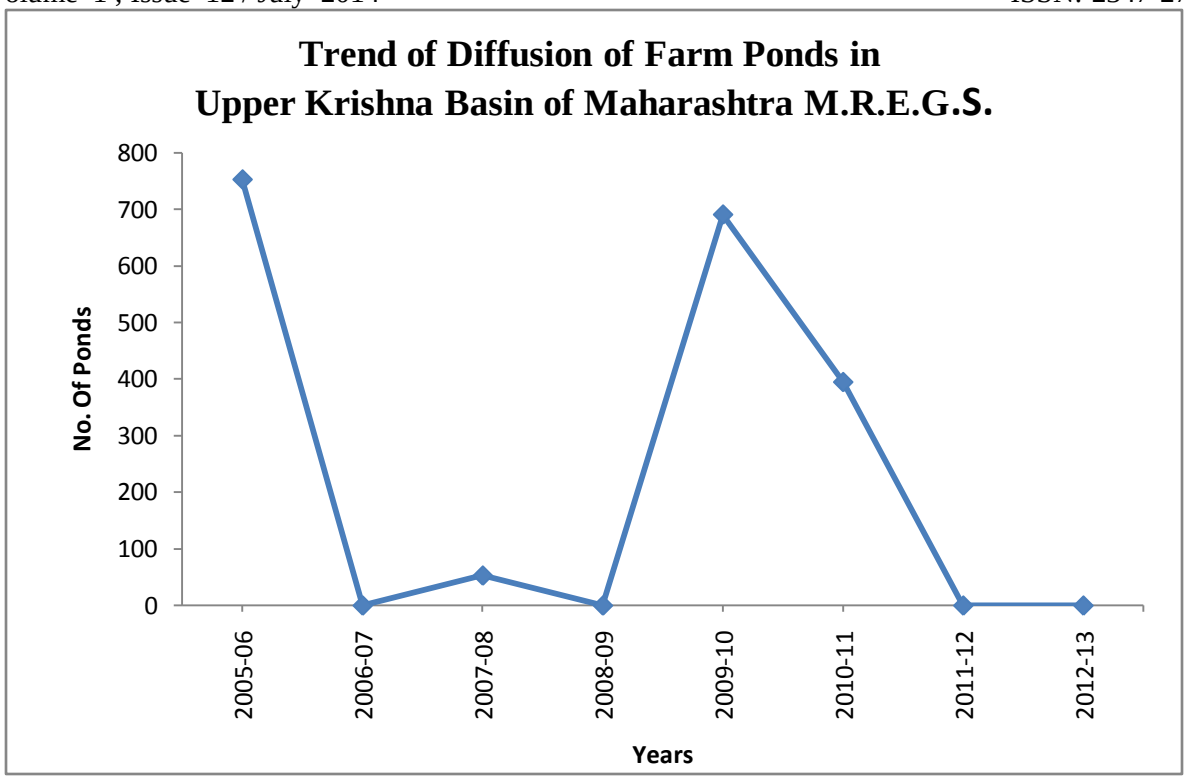

Fig. 1.4

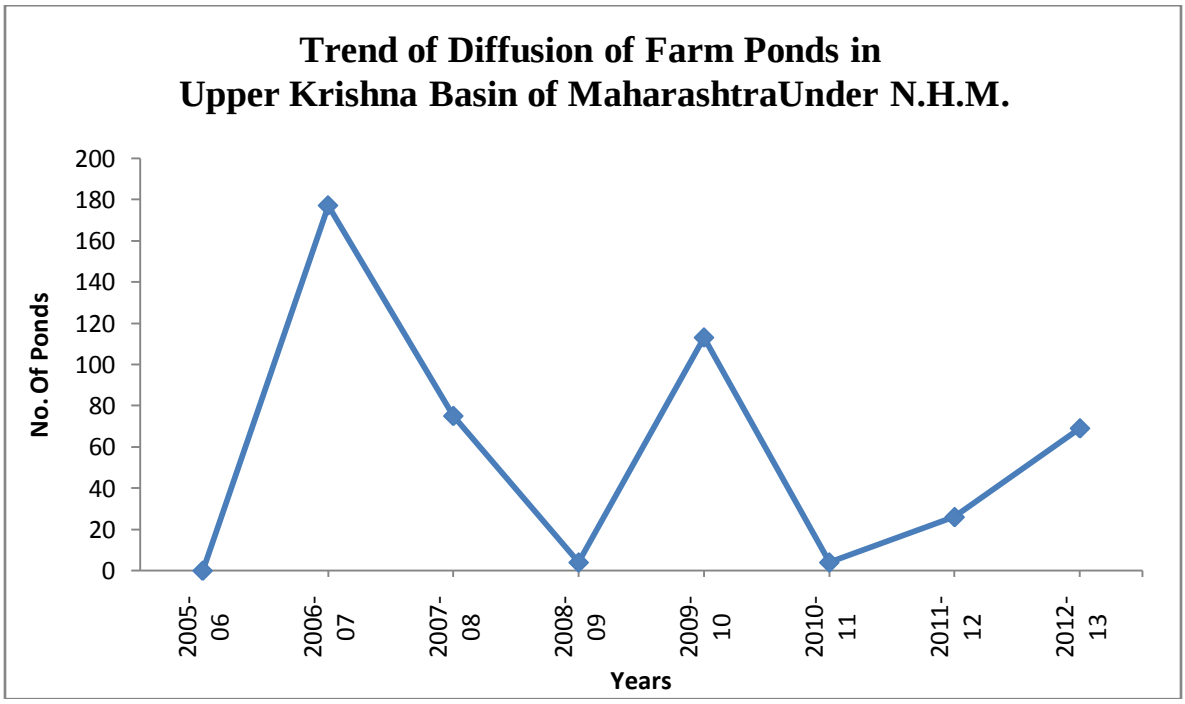

Fig. 1.5

Source: Data Compiled by Researcher through Socio Economic Abstracts of Sangli Satara and Kolhapur District 2007 -08 and 2011-12.

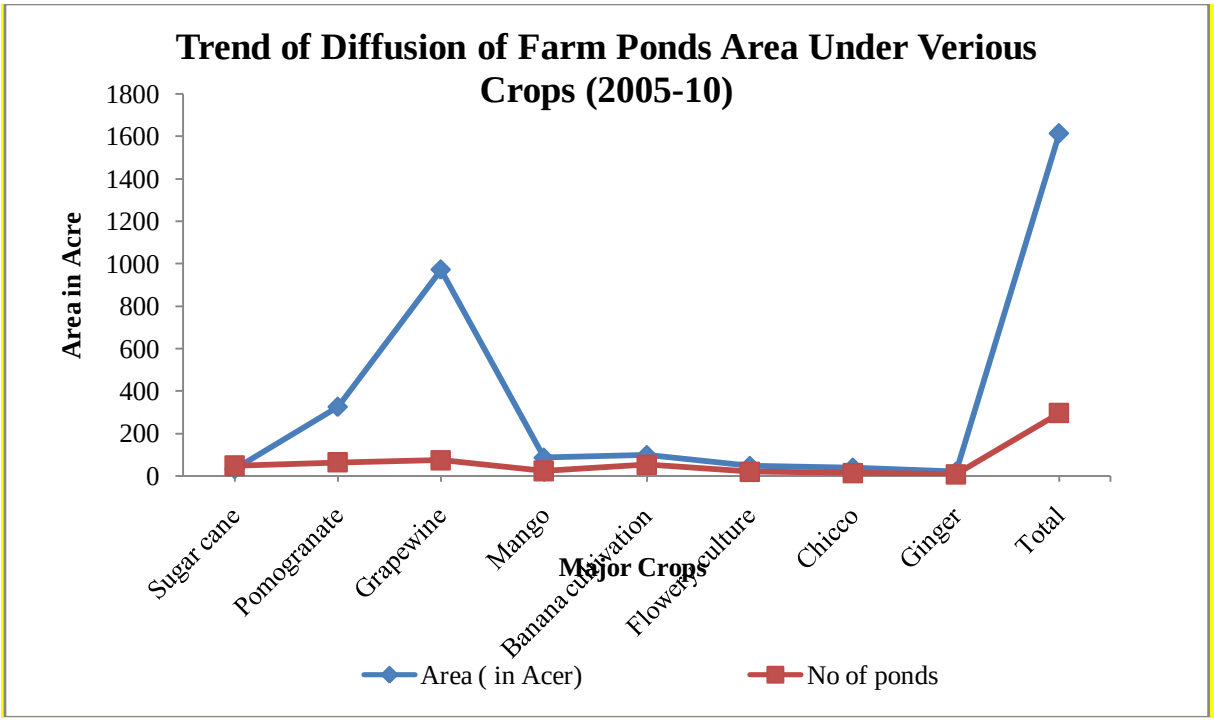

Fig. 1.6

Source: Data compiled by the researcher from, District, Divisional Agricultural Office of Satara, Sangli and Kolhapur.