



## IMPACT ASSESSMENT OF FARM PONDS-A CASE STUDY OF NGO INTERVENTION IN UTTAR KANNADA DISTRICT OF KARNATAKA

Savagaon L. G.<sup>1</sup> and S. T. Bagalkoti<sup>2</sup>

<sup>1</sup>Department of Economics, Karnataka University, Dharwad.

<sup>2</sup> Research Guide , Department of Economics, Karnataka University, Dharwad.

### ABSTRACT

*Manuvikasa, a non government organisation originating from Siddapur taluka of Uttar Kannada district of Karnataka has been rendering its services since 2003. It has delivered its intervention in Water conservation, Environment conservation, financial inclusion and other social programmes. Taking note of receding ground water resources and lack of irrigation facilities in the district, for cultivation of crops (both food and commercial) Manuvikasa NGO intervened to develop farm ponds/Small tanks to enable spring rejuvenation. Hence the primary objective of the present study was to analyse the Socio-economic benefits of such farm ponds on the sample households. The study revealed that the construction of farm ponds proved to be beneficial to the sample households in terms of increase in the area covered by various crops, increase in the income from agriculture and dairy farming activities, additional employment generation and augmentation of ground water level.*

**KEY WORD:** Farm ponds, Water conservation, NGO, Sustainable development.

### INTRODUCTION:-

Water is an integral part of the environment. It is finite but renewable resource. It needs to be managed properly. Smart water management is a pre- condition of Sustainable Development (UN-Water decade programme on Advocacy and Communication) Water is a crucial input for agriculture and allied activities. The water resources in India are under great pressure. Karnataka is one such state in India which depends on agriculture and its allied activities to a large extent. According Central Ground Water Board-Uttar Kannada-2012; dependence on irrigation through groundwater is high in Karnataka. This has led to over extraction of ground water resources. Uttar Kannada district of Karnataka receives average annual rainfall of 1166.3-3672.5 mm. The area irrigated by ground water is 9390 (ha). Dug well irrigate 7302 (ha) of agriculture area while bore-wells irrigate 2090 (ha) of agriculture land. This shows that there is a lot of pressure on the ground water resources. Taking note of lack of irrigation facilities in this district, the NGO's intervened to develop farm ponds to enable rejuvenation of springs.

### METHODOLOGY



For the present study Sirsi, Siddapur and Yallapur talukas of Uttar Kannada district were selected; since the NGO's have intervened in these talukas with regard to water conservation activities. With the assistance of the NGO authorities and staff the sample households were identified and a sample size of 36 households was selected. Since these talukas are covered with forests and the households are scattered in different villages' accessibility was difficult. In order to overcome this short coming, households nearer to these talukas were purposively selected. For the present study, the case study method of research was employed,

The primary data with regard to households socio-economic condition, cropping pattern, water harvesting structures and farmers overall perception in relation to water harvesting was collected with the help of pre-tested questionnaire. The secondary data was collected from the records maintained by the government offices and official websites of NGOs and Government of Karnataka. In order to assess the benefits received by these farmers, before and after scenario analysis was employed (i.e. before Manuvikas NGO intervention and after Manuvikas NGO intervention).

### **BEFORE MANUVIKAS (NGO) INTERVENTION**

Uttar Kannada district comes under malenadu agro- climatic zone with average annual rainfall of the district ranging between 1166.3 mm-3672.5 mm. (Central Ground Water Board-Uttar Kannada district) The farmers in these talukas grow tree crops like-Areca, Coconut, Banana and spices which needs regular irrigation. Due to the deficit in the rainfall and over use of groundwater, the water level in the wells had started to recede. Under such conditions guarding these tree crops was a challenging task for these farmers. Some of the farmers were finding it difficult to take care of the live stock since their need for water and fodder had to be met. As we know the farmers are completely dependent on the agriculture to meet their economic needs, some farmers took initiative and constructed farm pond in their farms with the help of Manuvikas (NGO) and taking lessons from such farmers today there is increase in the number of farmers wanting to construct one such farm pond in their farm to provide a shield to crops against unanticipated deficit in rainfall.

### **RESULTS AND DISCUSSIONS**

#### **Profile of the sample households**

In order to analyse the socio- economic impact, the sample households were categorised into two types, that is the Small farmers and the second group of Medium and Large farmers. As per the survey 63% of the Small farmers lived as nuclear families and 37% lived as joint families. While in case of Medium and Large farmers 77.8 % lived as nuclear families and 22.2 % lived as joint families. The percentage of Small farmers with APL (Above Poverty Line) card was less (33.3%) compared to BPL (Below Poverty Line) card holders (66.7%). 44.4% of Medium and Large farmers had BPL cards and 55.6% of them had APL cards. Among the Small farmers 74% belonged to OBC (Other backward communities) category while in case of Medium and Large farmers' majority (66.7%) of the farmers belonged to GM (General Merit) category. The survey reveals that the gender composition in both the type of farmers is more or less the same. The male as well as the female population was equally distributed. 72.5% of the Small farmers were literate while only 16.8% of the Medium and Large farmers were literate. The survey shows that 54.5% of the Small farmers and 16.2 % of the Medium and Large farmers were married. The main occupation of the respondents in the study area was agriculture. 27.7 % of the Small farmers and 40 % of the Medium and Large farmers were engaged in farming.

#### **Water harvesting structures**

In the study area the water harvesting structure was farm pond. These farm ponds were initiated by Manuvikas NGO's on cost sharing basis. Since these farm ponds were dug up using machine (HITACHI) the transportation charge of the machine was taken on by the NGO's.

The transportation cost was entirely borne by the NGO's but the construction charges of the farm pond as well as the labour charges were borne by the beneficiaries. Only in case of few farmers the NGO's had shared the cost of construction of farm pond. In the year 2012 when Manuvikas started construction of farm ponds, the entire cost was borne by them but gradually the cost was shared. 20 % was contributed by farmers while 80 % was put in by Manuvikas. With the increase in the awareness among the households, with regard to water harvesting structures the demand increased and so cost was shared in such a way that farmers were ready to pay 60% of the expenses and 40 % came from NGO's. Presently the entire cost is shouldered by the beneficiaries.

A farm pond of 30 feet length X 30 feet breadth X 10 feet height takes one day –that is 10 hours, however the time taken to dig up a farm pond depends on the type of the soil and the size of the farm pond. Excavation charge per hour was 1100/- rupees but, only 875/- rupees was contributed by the farmers. The remaining cost was shouldered by NGO's. Labourers were hired for converting these farm ponds into permanent water storage structures by the farmers. The inner wall of the farm ponds were covered with stone lining and steps were constructed so as to make it convenient to enter the farm pond and clean it whenever necessary.

The farm pond needs to be maintained from time to time depending upon the extent to which they become dirty. De-silting of farm ponds and taking away dried leaves has to be done just before the arrival of monsoon. The maintenance of farm pond, costs more in case of use of machinery but, less in case of use of manual labour. 41 farm ponds were constructed in the study area and the size of each pond varied in length, breadth and height. On an average 809503.38 litres of water was collected.

### IMPACT ON CROPPING PATTERN, OUTPUT AND INCOME

The survey revealed that 75% of the respondents were Small farmers and 25 % of them were Medium and Large farmers. 25.8% of the Small farmers land was irrigated while only 19.2% of the Medium and Large farmers land was irrigated. The major source of irrigation was open well, where, 22.2 % and 44.4 % of the irrigation was met through open wells in case of Small farmers and Medium-Large farmers respectively. Majority (63%) of the Small farmers' and (33.3 %) Medium and Large farmers depended on monsoon ,this shows that there was a lot of pressure on well irrigation and over use of ground water ,thereby making it essential to have some alternative source of irrigation. The major tree crops grown in the study area are Areca, Banana, Coconut and Paddy along with this spices like pepper and cardamom are also grown. These crops require regular irrigation. Realising the need for another source of irrigation the NGO's intervened to construct farm ponds, with an intension of rejuvenating the ground water. Information relating to the area covered by various crops, the output and the income generated from these crops before and after the farm ponds was analysed and the results are shown in Table no 1.1

**Table no 1.1**  
**Percentage change in area sown under different crops**

Type of farmer	Areca	Paddy	Banana	Coconut
Small farmer	12.3	0.0	18.3	31.2
Medium and Large	0.0	-7.1	6.6	0.0
Total	7.7	-2.8	12.8	18.5

Source: Field data

Table No. 1.1 reveals that the area sown under Areca, Banana, and Coconut had increased by 12.3 %, 18.3%, and 31.2 % respectively; in case of Small farmers. The area sown under Paddy remained the same. In case of Medium and Large farmers the area sown under Areca and Coconut remained the same ,while the area sown under Banana has increased by 6.6%.The area sown under Paddy had declined (-7.1%).

**Table 1.2**  
**Percentage change in the output of various crops**

Type of farmer	Areca	Paddy	Banana	Coconut
Small farmer	9.4	12.5	25.9	14.6
Medium and Large	10.5	7.1	14.6	18.3
Total	10.1	11.0	19.5	16.5

Source: Field data

Table 1.2 reveals that there was increase in output of Areca (9.4%), Paddy (12.5%), Banana (25.9%) and Coconut (14.6%) in case of Small farmers. Similarly the output from Areca (10.5%), Paddy (7.1%), Banana (14.6%) and Coconut (18.3%) had shown increase in case of Medium and Large farmers.

**Table 1.3**  
**Percentage change in income from various crops**

Type of farmer	Areca	Paddy	Banana	Coconut
Small farmer	18.3	17.4	46.6	30.3
Medium and Large	15.6	18.1	23.5	21.5
Total	17.0	17.7	34.9	25.0

Source: Field data

Table 1.3 shows that there was increase in the income generated from various crops. Small farmers' income increased by 18.3% (Areca), 17.4% (Paddy), and 46.6% (Banana) and 30.3% Coconut respectively. Similarly Medium and Large farmers secured 15.6% (Areca), 18.1% (Paddy), and 23.5% (Banana) and 21.5% (Coconut) increase in income. One thing to be noted here is that the area sown under Paddy had declined but the output had increased. One of the reasons could be use of SRI (System of Rice Intensification) method of rice cultivation, which uses less amount of water for paddy cultivation.

#### Impact on Dairy farming

**Table 1.4**  
**Percentage change in number of livestock**

Type of farmer	Cows	Buffaloes	Oxen
Small farmer	4.41	120	42.8
Medium and Large	60.8	100	50.0

Source: Field data

Table 1.4 reveals that there was increase in the number of live stock after construction of farm ponds since, water availability makes it convenient to meet the fodder and water needs of the live stocks. There was increase in the number of Cows by 4.41%, Buffaloes by 120% and Oxen by 42.8% in case of Small farmers. Similarly there was increase in the Cows (60.8%), Buffaloes (100%) and Oxen (50%) in case of Medium and Large farmers.

**Table 1.5**  
**Percentage change in Milk yield and Income from Dairy activities**

Type of farmer	Percentage change in milk yield	Percentage change in income from dairy activities
Small farmer	15.7	43.3
Medium and Large	48.3	75.6
Total	25.2	53.5

Source: Field data

The availability of fodder and water enhanced the milk yield. Table 1.5 shows that there was increase in the milk yield of the livestock owned by the Small farmers by (15.7%), Medium farmers and Large farmers by (48.3%), likewise there was increase in the additional income from allied activity like dairy farming. 43.3% of Small farmers and 75.6% Medium and Large farmers earned income from dairy farming activity.

**Table 1.6**  
**Farmers' Perception about Benefits of Water Harvesting (%)**

Perceived benefits	Strongly agree	Agree	Disagree
Soil erosion reduced	63.9	36.1	0
Groundwater level raised	77.8	22.2	0
Soil moisture increased	80.6	19.4	0
Reduced crop failure	66.7	33.3	0
Increase in yield	41.7	58.3	0
Generated employment	19.4	72.2	8.3
Increased land value	30.6	69.4	0

Source: Field Data

The farmers have obtained additional benefits from the construction of farm ponds. Analysis of the farmer's opinion is put up in Table 1.6. The data clearly reveals the diverse hydrological benefits realised by the farmers. Majority of the farmers expressed that farm ponds have been beneficial in the form of reduced soil erosion (63.9%); increased ground water recharge (77.8%); increased soil moisture (80.6%); reduced crop failure (66.7%); and Increased yield (41.7%). As far as generation of employment is concerned only 19.4 % of farmers strongly agree that farm pond construction provides direct employment ;since in the study area NGO's made use of machine (HITACHI) to dig out a farm pond ,however 72.2 % of the farmers agree that farm ponds generate employment in dairy farming and agriculture activities.

## CONCLUSION

The NGO intervention in water conservation has resulted in positive benefits to both the Small as well as the Medium and Large farmers, in terms of increase income; not just from agriculture but also from allied activities. It has led to increase in the output as well as change in cropping pattern. Farm ponds are not the only solutions to water scarcity but they can help the farmers in times of deficit in rainfall. However the monsoon plays an important role but during the monsoon, if the runoff water is collected and directed to a proper channel it helps augment the groundwater level. Such interventions by NGO's give confidence to farmers to accept and adopt our traditional water harvesting methods which had taken a back seat otherwise. The benefits gained from such interventions can be adopted in other areas where there is a greater need for it.

## REFERENCE

- Omprakash, G.Sastry, Y.V.R.Reddy (2004): 'Impact of Watershed Development Programme in India', International Book Distributors, pp169-182.
- Gotur P.S. and S Devendrappa (2011): 'Benefits and economic viability of domestic rooftop rainwater harvesting', *International Journal of farm sciences*.
- N.Rajasekaran (1997): 'Farmers, Sustainability and Watershed Programmes', *Economic and Political Weekly*, 32(26), pp A55-A61.
- Desai Rajeshwari (2007): 'Impact assessment of Farm ponds in Dharwad', *Karnataka Journal of Agriculture Science*, 20(2) pp 426-427.
- C.H.Hanumantha Rao (2000): 'Watershed Development in India Recent Experience and Emerging Issues', *Economic and Political Weekly*, pp 3943-5358.



**Savagaon L. G.**  
Department of Economics, Karnataka University, Dharwad.