

# Socio-Economic Status of Pond as an Auxiliary Irrigation Source in Birbhum District, West Bengal: A Case Study

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**Abstract:** *Over the decades ponds/tanks have been a common and quite useful source of water in Bolpur-Sriniketan CD block of Birbhum district West Bengal. Other than non productive usages of pond water, economic activities have made this water source quite significant for district economy. Agriculture is economic backbone of the area and pond/tank is a part of this agro economy. But despite numerous ponds this water source is gradually losing its economic acceptance to the farmers for irrigation. There are different socio-economic reasons behind such contemporary status of ponds/tank. However this study is concern to evaluate that in spite of supportive physical condition to develop pond irrigation why this source is gradually losing its acceptance to the users in compare to the others means of irrigations.*

**Keywords:** Distribution, accessibility, Potential, Economic acceptance and contemporary status

## 1. Introduction

Water is the key component of agriculture. Quantity and timing of availability of water are equally considerable factors to lead a successful irrigation. However there are different criteria those control both the above mentioned factors, such as (1) types of the water conservations in nature, (2) distance of farm from the sources of water, (3) types of irrigation mechanisms to access the water sources and (4) influences of external anthropogenic factors. Infeasibility in any of them can affect the effectiveness of irrigation extensively.

## 2. Methodology

The purposive mode of sample mouzas to generate symbolic representation of amid tank/pond irrigation over the study area has been followed through obtaining and module broad set of census data (1991 and 2001). The following steps have been followed to select the sample mouzas.

**First**, the proportion of irrigated area to total agricultural area and proportion of pond/tank irrigated area to total irrigation area is calculated for each mouza of 1991 and 2000 decades.

**Secondly**, observing the nature of calculated numerical figures over the concerning decades seventeen parameters are set. These are:

- 1) Significant decadal increase in total irrigation- but tank/pond irrigation decrease in both the decades.
- 2) Proportion of total irrigated area and contribution of tank/pond irrigation remaining unchanged in both the decades.
- 3) Proportion of total irrigated area and contribution of tank/pond irrigation remaining unchanged in Increase in total irrigated area - introduction of tank/pond irrigation area.
- 4) Increase in total irrigated area - introduction of tank/pond irrigation area.

- 5) Irrigation area remaining unchanged – tank/pond irrigation proportion decreased.
- 6) Irrigation area remaining unchanged – tank/pond irrigated area increased.
- 7) Insignificant increase in total irrigated area - tank/pond irrigation proportion increased.
- 8) Total irrigated area decreased but significant increase / new introduction of pond/tank irrigated area. And so on.

All the mouzas are distributed into different groups on the basis of these parameters accordingly to get a comparative module on the basis of which the previous and present irrigation and pond/tank irrigation status of the mouzas can be evaluated.

**Thirdly**, comparing the decadal variation of percent figures the absolute values have been referred back. After evaluation these calculated figures are compared with raw data of absolute values to confirm that both the values satisfactorily follow the same parametric rule, the final mouza have been selected.

**Finally**, the selected mouzas are again qualitatively categorized according to their decadal trend, such as,

- 1) Significantly reversal
- 2) Insignificantly reversal
- 3) Significant continuation
- 4) Insignificant continuation

Individually each selected mouza contains unique characteristic which in turn implies the present irrigation status of the CD blocks. Thus the selected mouzas posses both the common and extreme characteristics which encompass the respective CD blocks as a whole.

## 3. Analysis and Findings

Bolpur-Sriniketan CD block of Birbhum district is at the juncture of plateau and Ganga flood plain along the western

and eastern boundary respectively. Laterite and older alluvium are predominating soil types and both require regular water supply to retain soil moisture for crop production. Ajoy river which is characteristically non perennial in nature has created the southern most boundary of the area. Seasonal fluctuation of water level of this river is quite extreme. Post monsoon flood and pre monsoon dryness are common characteristics of this river. Undulating topography and sequentially fluctuating water table have made ground water availability quite vulnerable i.e. sharp variation in water table within negligible distance creates confusion to determine the depth of water level for drilling of tube wells. Along with this geo-hydrological formation is also infeasible in terms of ground water replenishment and subtraction ratio. Formations of permeable and non permeable rock strata have largely affected the ground water storage potential. Unlike other surface and sub surface water sources only surface water harvesting is not obstructed due to topography.

However it is different thing that erratic nature of monsoon can totally collapse the entire irrigation system of the area due to topographic constrain. It is a common drawback for all the irrigation sources of the area. And it is insurmountable. The topography of the area does not allow monopoly of single irrigation source. Ponds as surface water harvesting medium are quite useful. Though there are various reasons that do not permit to develop integral pond irrigation system over the area. But as a supplementary source ponds are more accessible to the farmers rather than other sources. To avoid the standing crop failure disaster due to time lag factor of canal and defunct condition of tube wells (shallow and deep) ponds are good back up for the area.

The area has numerous ponds. It is a good storage medium of surface run-off water and rain water. In this block 29.9% ponds are exclusively used for irrigation. No such extraordinary technical support is actually required for water lifting and transportation of water to the agro land. Only diesel pump is used to serve both the purposes. Single pond irrigates near about 4 to 5 ha of land. With enhancing the cushion area additional land can be irrigated.

There are three prominent pond irrigation statuses that have come across - decadal decrease of pond irrigation area, total drop of pond irrigation area and overall consistency in pond irrigated area. And none of them is depicting any feasible condition of pond irrigation over the area. Despite the above mentioned convenience of ponds over the area this means of irrigation is not that much of preferable to the farmers.

In most of the villages of this block due to irregular location and insufficient number as per necessity the acceptance of this means of irrigation is gradually reducing. The fact is as ponds cover micro command area therefore number and spatial distribution of them are most considerable factors. To get the proper utility of ponds the location of irrigable ponds must be nearest and within the cultivated land. And along with that the ponds must be good in number. But there is the scarcity of these kinds of ponds in most of the mouzas (villages).

Considerable numbers of age old receptacles are not properly maintained therefore the capacity of water holding has reduced significantly. So the existing ponds are not at the condition to use extensively. Under NREGA (National Rural Employment Guarantee Act) pond re-excavation works have been initiated in different villages but political cross current and financial bottleneck conditions of the local administrations (*Panchayat*) have neither able to provide 100 days of employment assurance nor able to develop the pond condition according to expectation.

New pond digging within agro land is quite objectionable because of land mitigation problems. With less than one hectare individual land holdings it is not possible for farmers to accept further reduction of their lands due to pond digging. In fact as entire agro lands of the villages are not under any irrigation and these particular areas are mainly depending on rain water only therefore the uncertainty of crop is more acute for those areas. But despite very poor scope to develop any intricate irrigation mechanism farmers are not at all convince for pond within their accessible distance because of the above reason.

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