

Socio-economic Challenges Caused by Fresh Water Crisis in Mandir Bazar Block of South 24 Parganas District, West Bengal

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Abstract

Mandir Bazar Block is located in the middle portion of South 24 Parganas District with various physical and socio-economic challenges of development. The main occupation of the working people is agriculture, but the area is characterised by single-cropped agriculture. Agriculture is possible only in the Kharif season. In summer and winter the agricultural land lying vacant. Middle portion of the district where the block is located, has high clay content in soil, so the agricultural field becomes very dry and create cracks in summer. Waterlogging in the rainy season is another problem which creates delay in harvesting in monsoon season. In this region, another problem people face is lack of drinking water. Supply of potable water is still unavailable. People collect drinking water from hand pumps which is far away from their home. Every ICDS centre, primary school, secondary school don't have drinking water still now. Unemployment is so serious that more than 30 percent people live under poverty line. In this context, a study has been made in this block to review the situation of socio-economic constraints causes by scarcity of fresh water. Both physical and socio-economic challenges have been considered for this study.

Keywords: *physical water scarcity, economic water scarcity, unemployment, poverty*

1. Introduction

Water scarcity is the lack of sufficient available water resources to meet the demands of water usage within a region. One of the major Sustainable Development Goal (SDG-6) is 'Ensure availability and sustainable management of water and sanitation for all.' 3.6 billion people worldwide (nearly half the global population) are already living in potential water scarce areas at least one month per year.(UNESCO,2018) Water scarcity is of two

types: Physical and economic. Physical water scarcity is the result of inadequate natural water resources and economic water scarcity is the poor management of available water supply. Scarcity of water creates water insecurity, which violates basic principles of social injustice. Water insecurity hamper health, dignities and productive life of a person and lack of potable water create social tension also. Productive life associated with productivity in different sectors of economy. Agricultural sector fully depend on fresh water whether it is rainwater or supply water. Lack of productivity creates food insecurity. So water scarcity affects basic need of the people.

Mandir bazar block of South 24 Parganas District is a backward block in terms of human, economic and social development

2. Location of the area

Mandirbazar Block is one of the 29 community development block in South 24 Parganas District of West Bengal. Diamond Harbour-II block is located in the west, in the east it has Jaynagar municipality and Jaynagar-II block, Mograhat-II block is situated in the north (HDR 2009). The main cause of backwardness is single cropped agriculture which concentrated in rainy season only. Other seasons face acute water scarcity. Not only that, lack of safe drinking water is a serious threat to people's health scenario. So resolving this problem is prime responsibility to local administration. In this paper an attempt has been made to find out the causes of scarcity of water and how it act as constraint of development in the concerned block and Mathurapur and Kulpi block located in the south. It is nearly 65 km away from megacity Kolkata. Rank of the block is 22 in case of Human Development Index out of 29 C.D. Blocks in the District. (HDR, 2009).

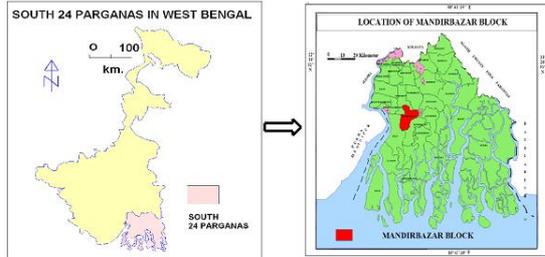


Fig: 1

Source: Census of India, 2011 and NATMO

3. Objective of the study

The objectives of this study are:

- i) To find out the types of water scarcity
- ii) To analyse the causes of water scarcity

4. Database and Methodology

Data have been collected from Bureau of Applied Economics and Statistics of West Bengal, Census of India (2011), Socio-economic and Caste Census (2011), Block Development Officer, Mandir Bazar,

Agriculture Development Officer,

5. Results and discussions

Water scarcity of Mandirbazar Block is not natural. Deltaic plain of river Hugli has huge amount of ground water and surface water potential. The distance of river Hugli from this block is only 25 km. Rainfall also high in this area. Geology, soil condition and ineffective management policy play crucial role in ground water lifting and surface water use.

5.1 Geology: Mandirbazar Development Block is located in the mid-west of South Twenty four Parganas District. The location of the block is in the mature deltaic plain of river Hugli which is covered by Quaternary sediments deposited by Ganga and its tributaries. The top of the alluvium is clayey in nature with varying thickness of 15 to 75 metres. To evaluate the consequences of water scarcity in this block To assess the government policies taken so far to resolve these challenges Mandirbazar block and Household survey. Collected data have been tabulated, calculated and analysed with maps and diagrams. Twenty First Century GIS software has been used to prepare the maps.

Underlying the clay blankets occur a huge thickness of unconsolidated sediments composed of silt, fine to coarse grained gravel with increasing thickness. The gravel zone may be considered as a marker horizon which is underlain by another extensive clay zone at varying depth.

5.2 Climate and Soil:

The climate is tropical monsoon type and characterised by hot and humid nature. Average rainfall is 180 cm which set in second week of June and withdrawn in mid-October. Soil type is Alfisols which is deep fine clayey in nature.

5.3 Status of Ground Water Development:

Generally upper group of aquifer contains saline water at a depth of 80 to 150 metre and fresh water bearing aquifer within 160 to 360 metre below ground level. (Bandyopadhyay and Basu, 2017). As the first layer is saline in nature, the second group of aquifer is source of fresh water in this block.

Table-1: Depth of Groundwater in Mandirbazar Block

Occurrence of aquifer and its potentiality	Feasibility of ground water structure	Ground water abstraction structure for irrigation	Depth to peizometric level (m bgl)	
			Pre monsoon	Post monsoon
The upper confined aquifer system occurs in between 80 to 150 m bgl containing brackish water, and the deeper second group of confined aquifer occurs in between 160 to 360m bgl containing fresh water.	Heavy duty deep tube wells with yield of 50 to 150m ³ /hr are feasible.	STW-0 DTW-2	4.90 to 5.90	4.20 to 5.38

Source: Central Ground Water Board, 2009

5.4 Types of Water scarcity:

Two types of water scarcity are present in this block.

5.4.1 Physical water scarcity:

It is lack of natural water resources and totally depend on hydro- geology of the area. Surface soil also plays a crucial role in drainage system. In the rainy season there is sufficient rainfall, but the drainage condition is so poor, rainwater cannot percolate downward due to thick clay content. Waterlogging condition prevail for a long period. Using this rainwater aman paddy grown every year. But in 2015, no cultivation was possible in this block due to flood, where waterlogging condition prevail at least three months. But after rainy season, soil becomes dry quickly. In winter, soil moisture is so less, agriculture is not possible without supply of water. Then few people cultivate their land with supply of pond water. But most of the agricultural land lying vacant.

5.4.2 Economic water scarcity:

Economic water scarcity appear due to mismanagement of excess rainwater. If it was

possible to reserve excess rainwater by excavation of pond, then it can be possible to use these water in winter season. But, government policies to harvest excess rainwater are not effective enough to store this precious water resource. In case of drinking water, depth of aquifer is more than 160 metre below ground level and local people cannot install deep tube well by their own due to havoc installation charges. So government initiatives are essential to supply drinking water to the local people. Both source and location of deep tube well are not favourable here and people face acute water scarcity which is economic in nature.

6. Consequences of Water Scarcity

Water scarcity directly hit socio-economic condition and health scenario of the people in this block. The effects are as follows:

6.1 Dearth of Drinking Water:

Analysing the sources of drinking water it is shown that most of the households collect drinking water from hand pump which is sometimes near the house sometimes away from houses. Those who stay away from source of water cannot collect sufficient water regularly. In summer, most of the hand pump fail to lift water, then people collect water two or three km. away from home.

Table-2: Source of Drinking water in Mandirbazar Block

Tap water from treated sources	Tap water from untreated sources	Covered Well	Un covered Well	Hand pump	Tube well/Bore hole	Others
1950	230	120	45	39,180	3,200	46

Source: Census of India-2011

6.2 Deficiency in Irrigation Water:

Source of irrigation is mainly pond all over the help of rainwater, but after rainy season, summer moong, sunflower, ladies finger is cultivated in some field with the help of pond water. Land use pattern of this block clearly reveals that at least 85 percent land utilised as agricultural land, but here source of irrigation(fig-3) is pond, which dried in winter and cannot provide sufficient water to grow major crops in summer.

Land Use Pattern of Mandirbazar Block

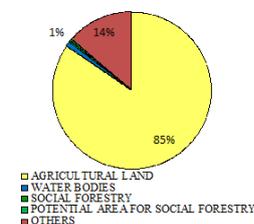


Fig.2

Source: District Statistical Handbook, 2014

Source of Irrigation in Mandirbazar block

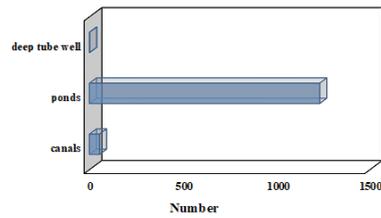


Fig.3

Source: ADO, Mandirbazar

6.3 Occurrence of Seasonal Unemployment:

Most of the people in this block engaged in agriculture as cultivator or agricultural labourer. But agriculture is not possible all over the year. They do it only in rainy season. Due to scarcity of water, in winter and summer, people engaged in other works, such as small business, labourer in construction sector in Kolkata, vegetable vendor, railway hawker in local train etc. From the fig-4 it is clear that most of the people engaged in other work, not agriculture. By observing the land use pattern it is also clear that most of the land utilised in agriculture purpose, but agriculture is not the main occupation of the people. Seasonal unemployment is excessive due to scarcity of water all over the year.

Class of Total Workers in Mandirbazar block

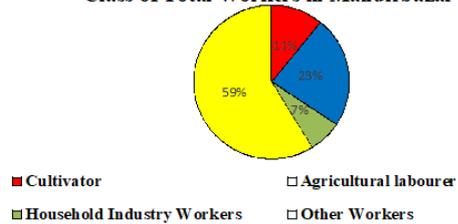


Fig 4 : Source: District Statistical Handbook, 2014

6.4 Incidence of Poverty:

As agriculture is not possible over the year, people have to do other work for their livelihood which is just life sustaining not profit making. Poverty is parallel with livelihood in this block. In case of poverty rank this block is in 14th position out of 29 blocks. 30% people of the block live below poverty line.

Table-3: Prevalence of Poverty in Mandirbazar Block

Rank	Name of the Block	Poverty ratio(% of household)
Lowest	Thakurpukur-Maheshitala	6.44
Medium	Budge-Budge-II	34.04
Highest	Basanti	64.89
Selected Block	Mandirbazar	29.90

6.5 Decreasing Crop Production:

Monsoon is the season of cultivation, but in winter season boro cultivation takes place all over the district. Following table (table-4) shows that, area

under boro cultivation is lowest in Mandirbazar block among the district and water scarcity is the prime reason behind these decreasing area under crop production.

Table-4: Area under Boro Cultivation in Mandirbazar Block

Rank	Name of the Block	Area under Boro Cultivation (area in hectare)
Highest	Bishnupur-I	7,928
Medium	Falta	5,662
Lowest	Mandirbazar	10

Source: HDR, (2009)

6.6 Incidence of Water Borne Diseases:

Among water borne diseases, diarrhoea and enteric fever are very common in this block. It is due to consumption of contaminated food and water. Diseases mainly occurred in rainy season (July to October).

6.7 Loss of Working Hours:

Analysing the fig 5 it is clear that, nearly 40 percent people collect drinking water from distant places. In day time young women and girl children collect water. Girl children loss hours from their study time, young women loss productive hours for water collection as most of the households have location of the deep tube well away from home.

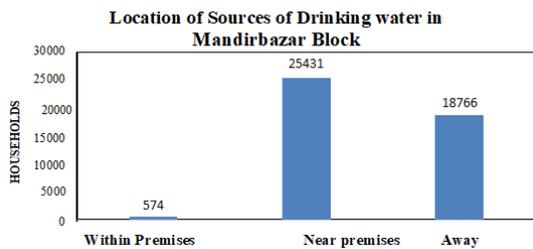


Fig 5 Source: Census of India, 2011

6.8 Increasing use of Contaminated Water:

Uses of contaminated pond water are seen all over the block for household purpose, such as bathing, cooking and washing clothes etc., which is not hygienic. The condition worsens in summer, because many deep tube well fail to lift drinking water. People have to collect drinking water from distant places and use pond water for household purpose increase.

7. Case study:

A case study had been conducted in the three villages of Mandirbazar block viz Madhabpur, Raghunathpur and Bireswarpur. The major objectives were to find out people's perception regarding the nature and causes of water scarcity they face in their everyday life. 100 respondents from three villages were taken. Study reveals that people in the above villages use hand pump for drinking purpose and in summer if hand pump fail

to lift water, people have to collect from away location. Some people use hand pump with shallow depth in their households. Most of the people use pond water for bathing, washing, cooking and cleaning (Fig-7). A general consciousness has been seen in case of drinking water, but other household purposes are totally neglected in terms of hygiene consciousness. Occurrence of waterborne disease like diarrhoea is frequent in all the villages.

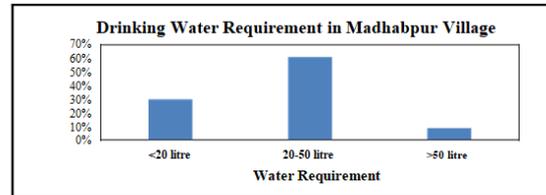


Fig-6 Source: Primary Data, 2017

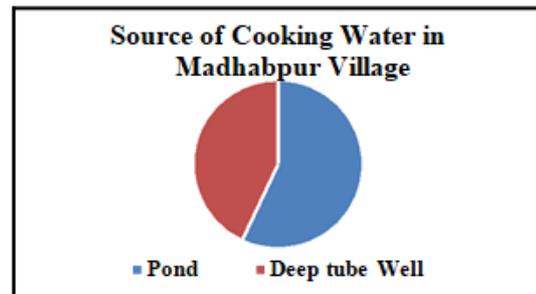


Fig-7 Source: Primary Data, 2017

In Bireswarpur village it is seen that, number of households is more than other two villages, and people have high water requirement. In this village most of the people collect water from a distance of more than 100 mt. and in some cases it is almost 400mt. In case of agriculture, it is seen that all people cultivate their land in rainy season using rainwater. But after harvesting, in Rabi season no cultivation is possible. Few cultivator use pond water and few canal water, most of the land lying vacant. In 2015 no cultivation was possible due to heavy rain and waterlogging condition. So the nature of scarcity is fully economic where mismanagement of rainwater creates trouble. Supply of canal water is negligible and people demand more canal water in winter.

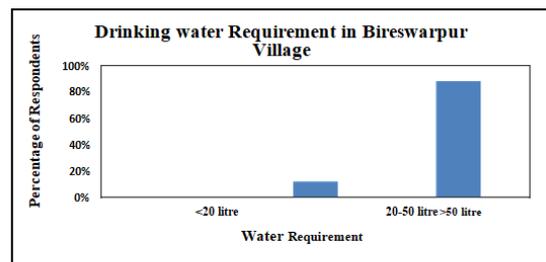


Fig-8 Source: Primary Data, 2017

8. People's Perception Regarding the Unprecedented Situation:

People in these three villages opined that due to more depth of ground water they cannot install hand pump personally, as the cost of instalment is too high for them. Lack of Governments initiatives to install hand pump and acute poverty are responsible for these worsen situation.

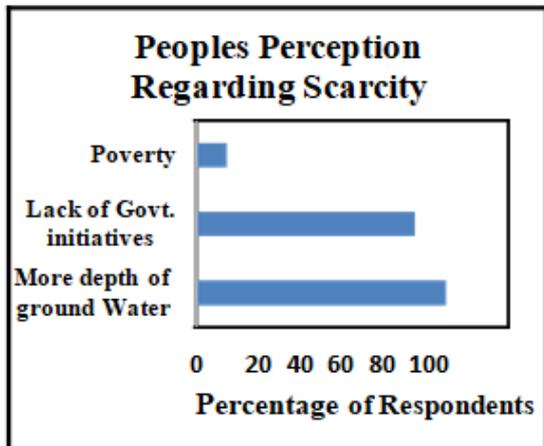


Fig-9 Source- Primary Data, 2017

9. Conclusion

In conclusion it may be said that the block is not in water stress situation, but it is mismanagement and lack of people's consciousness regarding their right to water. Only Proper Governmental policy to set up more hand pump for drinking water and deep tube

well for irrigation with canal irrigation can change the scenario.

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