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DEPLETION OF GROUND WATER & WATER RESOURCE MANAGEMENT: A CASE STUDY OF MALDA DISTRICT

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ABSTRACT

The most abundant single substance in the biosphere is the familiar but unusual inorganic compound called water. The earth's oceans, ice caps, glaciers, lakes, rivers, soils and atmosphere contain 1.5 billion cubic kilometers of water in one form or another. In nearly all its physical properties water is either unique or at the extreme end of the range of property. Its extraordinary physical properties, in turn, endow it with a unique chemistry. From these physical and chemical characteristics flows the biological importance of water. It is the purpose of this article to describe some of water's principal qualities and their significance in the biosphere.

KEYWORDS; ***Ground Water, Water Resource, Rain-Fed Farming, flood mitigation, shoreline stabilization, nutrient retention.***

INTRODUCTION

Water remains a liquid within the temperature range most suited to life processes, yet in due season there are occasions when liquid water exists in equilibrium with solid and gaseous form, for example as ice on the top of a lake with water vapour the air above it and as percolated beneath surface, known as soil moisture creating underground water reserves.

Now, for the last thirty five years, we have thought about the Green Revolution the help of underground water to feed our millions. We have almost no regulations for groundwater withdrawal. Practically if one has a pump, he can withdraw as much groundwater as he wishes. Now the question arises whether, we have any alternate source of water; the answer is we have about 2000 mm of rainfall and 4000 sq.kms wetlands in West Bengal. We have river basins, flooded every year, but actually, are not utilizing this water resource at all. Our big lakes, beels are not at all utilized as for exmple, Durgasagar Lake, Chand Beel, Bhatia Beel, Basudha Beel, Ahiron Beel etc. In the affected districts most beels are not properly utilized and some of them have been dried out. If we could utilize these water bodies, the high rainfall and basins, not only would meet a good percentage of our water demand but be used for pisciculture and duck breeding and also could regulate the underground water reserves.

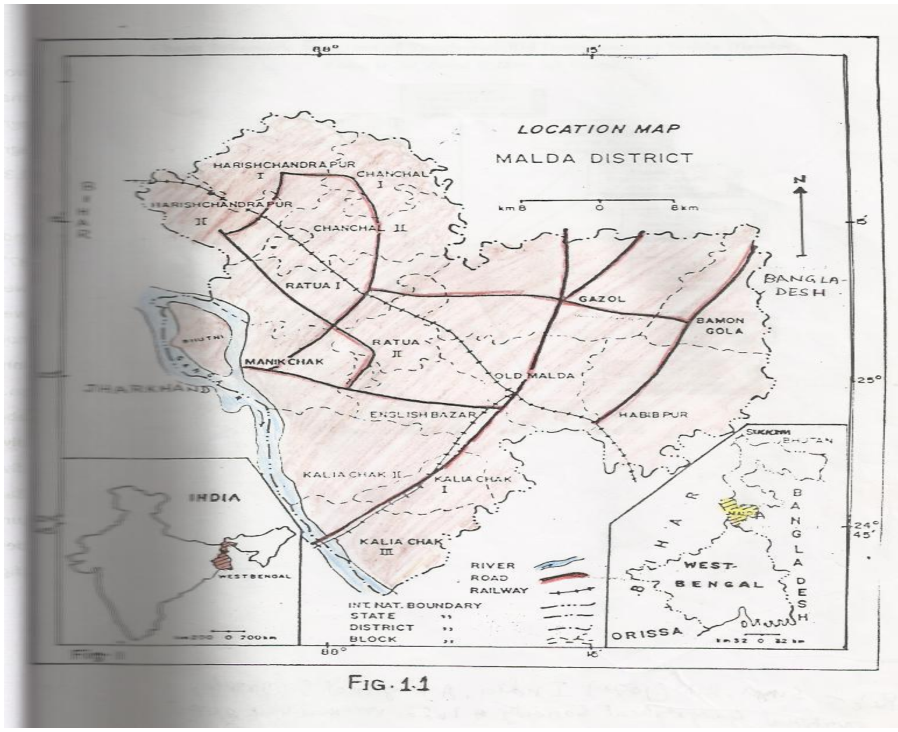

Figure 1

GROUND WATER TABLE AND ITS UTILIZATION — DISTRICT MALDA

In this district, the Tal is a region which is centrally depressed and having a water level between 3.60 to 5.70 m on an average, which in the Diara ranges from 6m to 70 m. The hydrological map of the underground water level, clearly indicates that, the major portions of Barind, have the lowest level of underground water. In its western margin, along the river Mahananda and in the central portion along Tangon, re placement of underground water has made the water level at the depth of 6 to 7m. Tal region, water level is within 2.1m to 4m, below the surface in Harischandrapur I and II while in the blocks of Chanchal I and II, the water level is at the depth of 4.83m to 5.46m. The Blocks of Ratua I and Rutua II located between the Kalindri and Mahananda river have levels at 4.20m to 4.62m and 4.83m 16m below the surface. In Diara tract water level is relatively nearer to the surface in the south and the depth increases northwards. In English Bazar the water level is located at 3.62m to 4.26m while in Manikchak it is at the depth of 3.36m to 4.00m. these general trends there are pockets where water table is either high or low determined by the local slope, soil texture, soil structrue, rainfall and permeability factors. The following table reveals that two Blocks, named English Bazar and Kaliachak, together account for 22.7 percent of rain-fed area of the district. In these blocks more than 80% of their cultivated land depends on rainfall. This dependency 86% in Manikchak and in English Bazar proportion of dependency reaches as high as 93%.

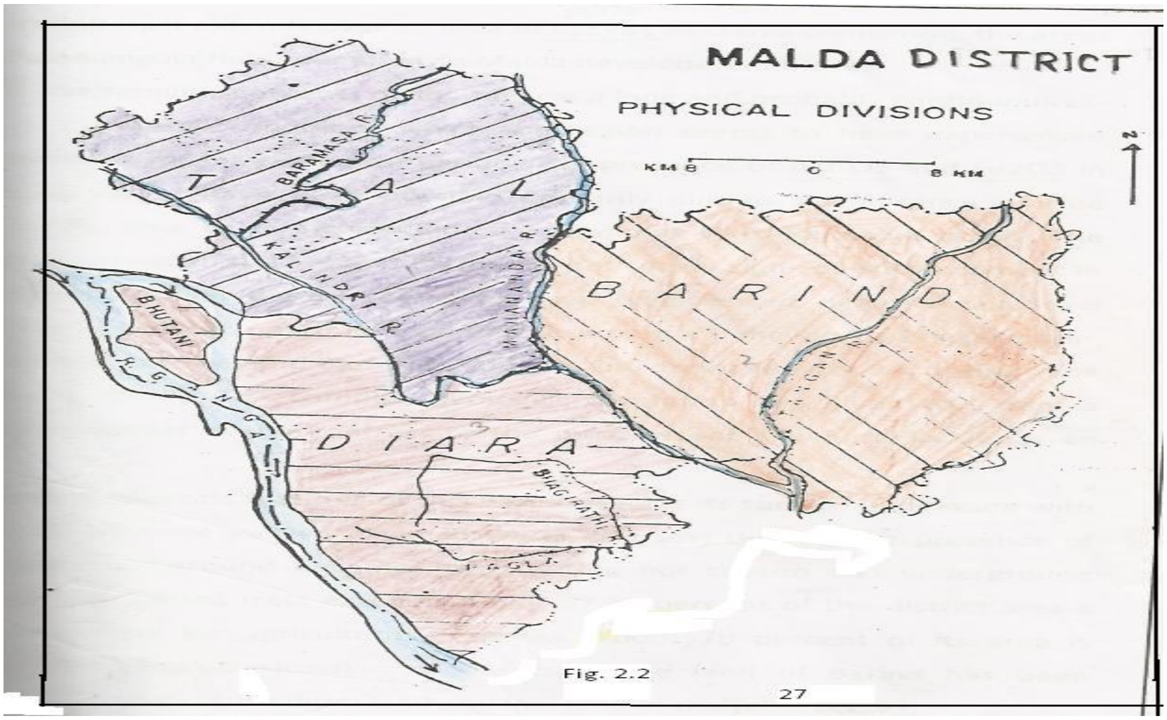

Figure: 2

In seven blocks, dependency is between 60 to 80% and they account for 51% of the rain-fed area of the district. Kaliachak-I tops the list followed by RatuaII, Bamangola, Gazole, Chanchal-II, Ratua-I and Chanchal-I and they are spread over all the three phsiographic regions, Tal, Barind and Diara. Four blocks with 23.7% of the district's rain-fed cultivated area, 40 to 60% of their net sown area, depend on rainfall. These blocks represent areas where irrigation sources have been amply exploited. The lowest dependency on rain is observed in Kaliachak-II and Harischandrapur-II, where less than 40% of their respective net sown area is not covered under irrigation. In these blocks only 2.6% of rain fed cultivated sown area of the district is located. In Harischandrapur-II, only 8% of net sown area depends on rain, while in Kaliachak-III about 32% of net sown area still presently in the district 62.4% of net sown still depend on rainfall for success agriculture.

Intensity of Rain-Fed Farming: Malda District (2010 - 2011)

PERCENT CATEGORY OF N.S.A	AREA IN (ha)	RAIN-FED FARMING IN % OF CULTIVATED AREA	NO.OF BLOCKS!
Above 80	39712.0	22.10	2
80-60	88910.4	51.00	7
60-40	41506.6	23.70	4
Below 40	4619.4	2.60	2
Total	174748.4	100.00	15

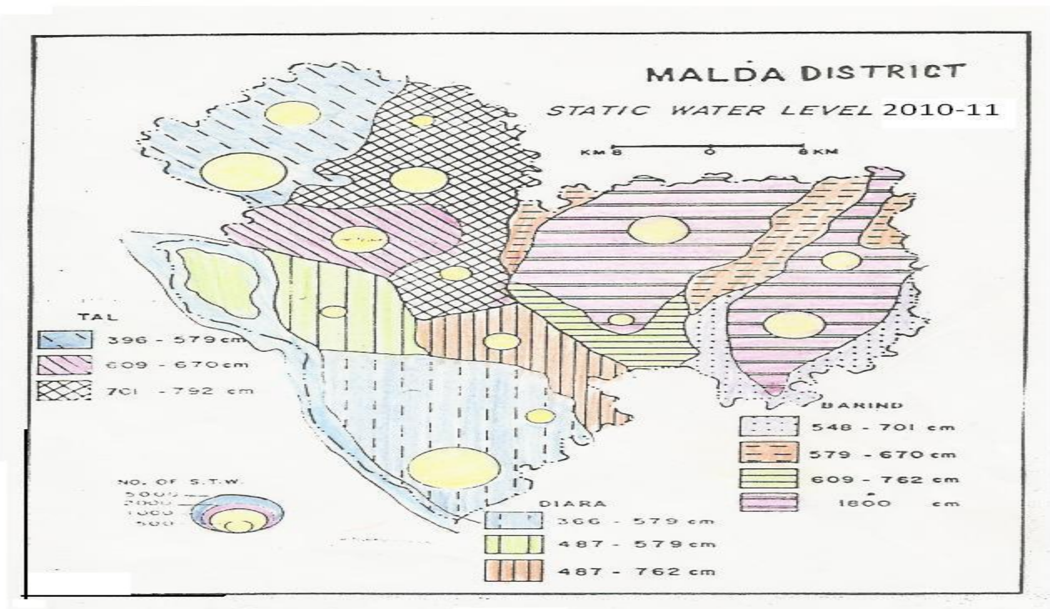

Fig. 2.11

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Figure: 3

This spatial distribution together outlines the scope for irrigational development. The development must aim to reduce the dependency on rainfall by reclaiming areas under irrigation and by fully exploiting the agricultural potentials of rain fed areas. This can be achieved through extending various sources of irrigation and by adopting suitable farming practices and crop selection where irrigational potentials are limited. In Malda district, where further increases in arable land is limited, irrigation has to play a vital role in agricultural development and at present, we badly need a proper watershed management and a proper regulation of underground water withdrawal, which is de pleted day by day.

Physiographically, the district is divided into three zones,(Fig-2) e.g. the Tal (Northwestern portion), Daira, (Southern region) and Barind, (Eastern zone). In North Bengal ground waters yield potential in the extremities of the piedmont plains appears to be lower than the flat alluvial plains of the Barind, Diara & Tal. Deeper regional aquifers store ground water under confined condition with Piezometric levels rising quickly at depths between 1.7 to 3.8m below the surface. Nearly 60% of the ground water reserves of North Bengal are found in principal aquifers along Mahananda & Torsa Basin.Within the district, in general, the ground water depths are less than 5m during the summer month, during dry months range between 5 to 10m and between 1 to 10m during the rainy months. Very deep water table during both summer and rainy months are noticed in the Barind tracts i.e. in the blocks of Gazol, Bamangola and Habibpur. An estimate of annual ground water recharge in a region can be derived from co efficient of the average water holding capacity of the regional soil.

The Malda district is blessed with sub-alluvium charged by gound water resources and storage of underground water. Climatically the district has potentiality to grow crops only around the year basis if its water resources are exploited and developed with the physiographic region. The network of rivers in the district is 172 kms long and this has make it possible to develop a number of river-lift irrigation schemes in the district, apart from Ganga, which flows considerable distances from the South & the South-West boundary of the district. Most of the rivers such as Mahananda are mostly rain-fed and during pre-monsoon & summer water is available for lift irrigation. The physi ography of this district does not favour any major irrigation project to be installed. The irrigation is possible only through minor & small irrigation projects in the district based on the underground water resources.

The water table reaches surface level during monsoon and seepage is noticed particularly in saline-alkaline soil. Water loggings are common problem in Tal areas & in low lying depressions. In such areas proper drainage is required for soil moisture regulations during rainy season.

In Malda district, like the other part of India judicious use of its water resources are inescapable need for sustained and successful agricultural operation, to check the depletion of ground water, to check the Arsenic contamination & to get a good yield and good respond to irrigation.

In West Bengal the first tube-well sunk in Nadia in 1962 and the villagers were reluctant even to touch the water. But at present their need is for own tube-well that means not only for the irrigation but for home consumption also millions of cubic meters of underground water now they are withdrawing. This seen is very common throughout West Bengal.

DEPLETION OF GROUND WATER & ITS IMPACT ON THE ENVIRONMENT

The problem of Arsenic contamination in West Bengal ground water has taken a very serious turn. About 20 lakhs people (report 2005 May) have been exposed shoeing arsenical skin problems. During the 1980s the local scientists reported that the reason for the presence of arsenic in tube-wells may be tube-well strainer, excess use of fertilizer or excess use of underground water. The first officially published report by school of environmental studies in May 1991 reported on the basis of simple calculation of arsenic concentration in water withdrawn for a year from a single Rural Water Supply Scheme (RWSS). This RWSS of Malda, in one year (1992), had withdrawn 147 kg of arsenic from underground in one year.)

In this respect, the wetland and other water bodies to balance the demand of water should be mentioned. Actually, wetlands are the lands transitional between terrestrial and aquatic system where the water table is usually at or near the surface or the land is covered by shallow water. It has been defined as 'areas of marsh, fen peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh brackish or salty including areas of marine waters, the depth of which at low tide does not exceed six meters.' Wet land play certain vital functions such as ground water recharge and discharge, flood mitigation, shoreline stabilization and reduction of erosion, sediment trapping, nutrient retention / removal, fish production, support for flood chains etc. In short, wet-lands and its resources, in many ways, directly and indirectly help to control environment pollution, promote developmental activities and maintain environmental sustainability.

In spite of these important roles being played wetlands in nature, for much of the human civilization, wetlands have been regarded as unproductive and even unhealthy lands, full of mosquitoes and different vectors. In fact, rather than conservation, consistent efforts have been made to convert the wetland for intensive agricultural or fisheries production or to fill them to create land for industrial or urban development. However, of late, their significance in terms of providing natural storage at the time of flood and development of fisheries during subsequent periods, with their natural or slightly modified state, is being exceedingly realized as productive ecosystems for sustainable socioeconomic development.

In district Malda, there are about more than 20 beels, of which 80% of the beels are perennial and 20% seasonal. With the growing interest in wetlands for supplementing human requirements and their ecological significance in terms of flood control, water purification, aquatic productivity, microclimate regulation and as habitats of fish and wild life, its conservation is increasingly accepted in this district as an important issue.

CONCLUSION

In basic structure the water molecule has a small dipole moment and is freely ionized. So water dissolves all pure and impure materials we need or not. But we have to collect water in such a manner which will ensure our existence in certain level preventing all ill effects. But the world's total ground water reserves are being depleted day by day which in near future will stop our urbanization. In Darjeeling district, in the town more than 50% population have to buy for their daily uses. Practically it is a common sense in more or less all mountain environments. But the rapid growth of urbanization has minimized the pore-space to regulate the underground water naturally. In rural areas, the maximum use of underground water is for agriculture. The daily needs of the villagers are being fulfilled from the local ponds, beels or rivers. On the contrary the total water supply in the urban areas depends on the underground reserves, which is depleted day by day. In district Malda the rate of the depletion of water table is from 35 to 53% a maximum in the Barind region, where there is no other way to meet the demand for agriculture to utilize the underground water, which exhibits the maximum water scarcity in the summer months and in the Diara Tract, maximum arsenic contamination. So, we have to ensure the future generation for sustainable development by using the other sources and to store the excess water for a better socio-economic environment.

REFERENCES

1. **Singh R. L** (1971) (ED) India: A Regional Geography, N, G.S of India Varanasi.

2. **Morgan, J. and Mc Intire**. (1959); Quaternary Geology of West Bengal Basin, East Pakistan & India, Bull Geol. Society. Am 70 Pp 319-342

3. **Gustafson A .F** (1947) Soil & Soil Management Mc Graw Hill, New York

4. **Hunter W.W,** (1973), A Statistical Accounts Of Bengal Malda Districts New Delhi Pp 1-40

5.**Tiwary A.R** (1972) ,Some Principles Of Landaus Chauhan K.N, Planning In Upper Ganga Plains In Safi.M (ED) Proceeding Of Symposium Of Landaus In Developing Countries 21, I .G.C Aligarh Muslim University.P.46

6. **Malda District Human Development Report** (2006-07) – District Welfare and Planning Office, Govt. Of West Bengal, Pp 54-86.

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