

DISTRICT AT A GLANCE

Sl. No.	Items	Statistics
1.	GENERAL INFORMATION	
i)	Geographical Area (Sq. km.)	4094
ii)	Administrative Division (as on 2001)	
•	No. of Subdivision	5 nos.
•	No. of Blocks	22 nos.
•	No. of Municipalities	27 nos.
•	No. of inhabited villages	1571 nos.
iii)	Population (as on 2001 Census) (with density of population)	89,34,286 (1102 per sq.km.)
iv)	Normal Annual Rainfall (mm)	2182
2.	GEOMORPHOLOGY	
	Major Physiographic Units	1. Natural levee, 2. Swamp and 3. Flood Plain
	Major Drainages	Bhagirathi, Ichhamati, Kalindi and Raimangal
3.	LAND USE (Sq.km.) (as on 2004-05)	
a)	Forest Area	937
b)	Net Area Sown	2655.14
4.	MAJOR SOIL TYPES	Entisols and Alfrosols
5.	AREA UNDER PRINCIPAL CROPS (Sq.km.) (As on 2004-05)	3808
6.	IRRIGATION BY DIFFERENT SOURCES (as on 2004-05) (Areas & No. of Structures)	
	Tube wells/ Bore wells	1490.26 sq. km. area irrigated through 62142 STW and 146.7 sq. km. area irrigated through 314 DTW
	Surface Flow	37.9 sq.km. area irrigated through nos. of Surface flow
	Surface Lift (RLI)	10.7 sq. km. area irrigated through 44 nos. of RLI.
	Net Irrigated Area	19628.25 sq. km
	Gross Irrigated Area	2120.64 sq. km
7.	NUMBERS OF GROUND WATER MONITORING WELLS OF CGWB (As on 31.03.07)	39
	No. of Dug wells	5
	No. of Piezometers/ Tube wells	34
8.	PREDOMINANT GEOLOGICAL FORMATIONS	Older and Younger Alluvium
9.	HYDROGEOLOGY	
➤	Major Water bearing formation	Sand (grey to yellow) fine to coarse grained, silt and gravel
➤	Pre-monsoon depth to water level during 2006	2.00 to 13.60 mbgl
➤	Post-monsoon depth to water level during 2006	1.64 to 10.66 mbgl
➤	Long term water level trend in 10 years (1997-2006) in m/yr	Rise 0.02 to 1.46 mtr in 10 wells and fall 0.16 to 5.95 mtr in 29 wells
10.	GROUND WATER EXPLORATION BY CGWB (As on 31.03.07)	
	No. of wells drilled	35
	Depth Range (m)	25.5 – 511.50
	Discharge (lps)	15.6 - 69.41
	Storativity (S)	1.05×10^{-3} to 1.45×10^{-4}
	Transmissivity (m^2/day)	699 to 8127

11.	GROUND WATER QUALITY	
	Presence of Chemical constituents more than permissible limit	Arsenic, Iron, Chloride
	Type of water	Bicarbonate type
12.	DYNAMIC GROUND WATER RESOURCES (2004) mcm	157640
	Annual Replenishable Ground Water Resources	141876
	Net Annual Ground Water Draft	101005
	Projected Demand for Domestic and Industrial Uses upto 2025	10859
	Stage of Ground Water Development	71.19 %
15.	AWARENESS AND TRAINING ACTIVITY	
	Mass Awareness Programmes Organized	
	1. Place Date No. of Participant	Barasat 29.3.2001 175
	2. Place Date No. of Participant	Asoknagar 12.12.2006 180
	Water Management Training Programmes	
	1. Place Date No. of Participant	Asokenagar 13.12.2006 14
16.	EFFORTS OF ARTIFICIAL RECHARGE AND RAINWATER HARVESTING	
	Projects completed by CGWB (No. & Amount spent)	One 12.02 lakhs
	Projects under technical guidance of CGWB	
17.	GROUND WATER CONTROLL AND REGULATION	
	Number of OE blocks	Nil
	Number of Critical Blocks	Nil
	Number of Blocks Notified	Nil
18.	MAJOR GROUND WATER PROBLEMS AND ISSUES	Arsenic and salinity problems

NAME OF THE DISTRICT: NORTH 24 PARGANAS

1.0 INTRODUCTION

Administrative details

- Location and area : The total geographical area of the district is 4094 Sq. Km. It has 5 subdivisions consisting of 22 blocks, 22 Panchayat samittee. The total police station is 36. There are 200 Gram Panchayats with 1571 villages. Barasat is the headquarter of this districts.
- Ground water basin : Lower Gangetic basin
- Drainage : The Bhagirathi in the west , river Ichamati in the east and rivers Kalindi & Raimangal in south eastern part forming the main drianage.
- Irrigation practices : The cultivation is done mainly by groundwater alongwith the surface water from canals,tanks and river.
- Studies of C.G.W.B : CGWB has completed systematic Hydrogeological survey and continuing Groundwater Management Studies. Apart from this, Groundwater Exploration has been carried out to delineate the aquifer geometry and to know the aquifer characteristics Special attention has been given to identify the arsenic free deeper aquifers and construction of tubewells adopting cement sealing techniques.

2.0 Rainfall & Climate

- Rainfall : The normal rainfall is of the tune of 1525mm.
- Climate : The district is characterized by humid, subtropical climate. It receives adequate Rainfall from South-West monsoon, which sets in the later half of June and Continues upto the middle of october.Premonsoon torrential downpour received During March- May. Max.and Min. temp as recorded is 41 and 09 degree Centigrade.

3.0 Geomorphology & Soil Types

- Geomorphology : The district can be divided into three (3) geographic units :
1. Natural Levee Areas
2. Swamp Areas
3. Older flood plain
- Soil Types : Depending upon the soil types the district is divided in two separated zones
a) Entisols comprise sandy loam which is found in the northern, central and western part of the district.
b) Alfisols comprise loam, silty loam which is found in the southern and south eastern part of the district.

4.0 Groundwater Scenario

- 4.1 Geology : The district is a part of lower Gangetic basin and is underlain by huge thickness of Quaternary Alluvium, laid down by the southerly flowing Bhagirathi river and its tributaries. The major area of th district occupied by Recent Alluvium consists of grey sand, silt and grey (semiplastic) clay. Older alluvium sediments occurs beneath Recent Alluvium,comprise grey to brown sand fine to coarse grained, gravel, clay

(grey to yellow) with kankar and ferrogeneous concretions. In northern and central part of the district top surface clay is occurring down to 5 to 12 mbgl, whereas in southern and south-eastern parts of the district average thickness of top clay layer is in the range of 25 mbgl.

4.2 Hydrogeology : Groundwater occurs in a thick zone of saturation in the alluvium deposited by the river system. The sand and gravel horizons of different textures constitute main aquifers.

Groundwater in the northern and central part of the district occur under water table conditions. However, in isolated patches in Barrackpore, Amdanga, Hadra-II and Rajarhat blocks, the top clay and sandy clay locally thick(20- 30mt) imparting semi-confined nature to the ground water body.

In the southern and south eastern part of the district, comprising Hasnabad, Hingalganj, Sandeshkhali and Minakhan blocks, ground water occurs under confined condition.

Depth to water level in unconfined aquifer during premonsoon period (2006) varies from 2.00 to 13.60 mbgl whereas that to post monsoon it is from 1.64 to 10.66 mbgl. Piezometric head in confined aquifer during premonsoon period (2006) varies from 3.47 mbgl to 6.25 mbgl whereas as that to post monsoon period (2006) varies from 1.91 mbgl to 5.89 mbgl.

Aquifer characteristics : Tubewells in the district are constructed tapping both unconfined and confined aquifers and are capable to yield 50 to 150 m³/hr with nominal drawdown of 4-5m. The yield of the shallow tubewells is about 20 to 40 m³/hr with a drawdown less than 4m. Transmissivity values ranges from 699 – 8127 m²/day and the storativity ranges from 1.05×10^{-3} to 1.45×10^{-4} . Specific yield ranges from 0.035 to 0.765.

4.3 Groundwater Resources:

The dynamic ground water resources of North 24 Paraganas district has been estimated jointly by CGWB and SWID, Govt. of West Bengal, following the norms laid down by GEC 1997 methodology and projected as on 31.03.04.

The reconciled figures are as under:

Total Ground Water Resources	:	157640 ham
Net Annual Ground Water Availability	:	141876 ham
Existing Ground Water Draft for All Uses:	:	101005 ham
For Irrigation	:	94066 ham
For domestic & industrial water supply	:	6939 ham
Stage of Ground Water Development	:	71.19 %
Allocation for domestic & industrial water supply requirement upto 25 yrs.	:	10859 ham
Net Ground Water Availability for future irrigation development:		36951 ham
Categorization of blocks	:	All blocks are categorized under 'Safe' category.

4.4 Groundwater Quality

The chemical quality of groundwater in the area in general of bicarbonate type. The chloride content in groundwater is low(18 – 234)mg/l in northern and central part of the district. The southern and south-eastern part of the district viz., Basirhat, Haroa, Hasnabad, Hingal ganj, Sandeshkhali, Minakhan upper aquifers are brackish to saline nature with chloride value ranges from 300 – 1241 mg/l.

The water is mainly neutral to mildly alkaline in nature and pH value ranges between 7.5 and 8.2. Total hardness as CaCO₃ ranges from 140- 670 mg/l. Generally iron content is above permissible limit in all the blocks ranges from 1.23-18.10 mg/l. but in few places it is found even of the order of 0.09 – 0.56 mg/l. Shallow aquifers within the depth of 100 mbgl shows arsenic concentration > 0.05 mg/l occurring in 253 mouzas in 17 blocks of the district. Deeper aquifers down to the depth of 350 mbgl are arsenic free.

9. Basirhat II	Multiple aquifer system occurs, in general, in the depth span of 16-31, 39-91,97-100,125-163 mbgl, T of the aquifers is about 700 -5000 m ² /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 6468 ham Irrigation has been done through 2374 nos of STW & 7 no of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 12683.09 ham. SOD is 61.76%	Safe block, WL declining Arsenic affected in down to depth of 80mbgl
10. Bongaon	in general, in the depth span of 13-53, 56-73,80-94,122-192,193-223,254-251 mbgl, T of the aquifers is about 700 -5000 m ² /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 18206 ham Irrigation has been done through 3974 nos of STW, 39 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 7790.32 ham. SOD is 79.43%	Safe block, WL declining Arsenic affected in down to depth of 80mbgl
11. Deganga	in general, in the depth span of 6-20, 22-64,74-110,126-178 mbgl, T of the aquifers is about 700 -5000 m ² /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 10721 ham Irrigation has been done through 5986 nos of STW, 9 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 8715.05 ham. SOD is 86.95%	Safe block, Arsenic affected in down to depth of 80mbgl
12.Gaighata	in general, in the depth span of 9-54, 197-215 mbgl, T of the aquifers is about 700 -5000 m ² /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 13395 ham Irrigation has been done through 6970 nos of STW,23 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 3113.03 ham. SOD is 70.5%	Safe block Water Level declining during both pre & post monsoon period
13. Habra I	in general, in the depth span of 3-34,37-40,44-47,56-104,122-152,158-182,223-247,260-278 mbgl, T of the aquifers is about 700 -5000 m ² /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 7169 ham Irrigation has been done through 2618 nos of STW, 27 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 25132.38 ham. SOD is 66.41%	Safe block, Arsenic affected in down to depth of 80mbgl
14. Habra II	in general, in the depth span of 2-45,49-82,110-152,167-174,189-219 mbgl, T of the aquifers is about 700-5000 m ² /d.	Low duty (20-40 m ³ /hr) tube wells are generally feasible	Net GW Availability is 6669 ham Irrigation has been done through 1360 nos of STW, 35 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 542.5 ham. SOD is 46.58%	Safe category, WL declining Arsenic affected in down to depth of 80mbgl
15. Rajarhat	in general, in the depth span of 3-39,40-57,70-143 mbgl, T of the aquifers is about 700 -5000 m ² /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 4722 ham Irrigation has been done through 918 nos of STW, 3 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 14261.89 ham. SOD is 43.77%	Safel block, Arsenic affected in down to depth of 80mbgl
16. Haroa	in general, in the depth span of 2-27, 36-78,122-161 mbgl . T of the aquifers is about 1200 -2000 m ² /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 6960 ham Irrigation has been done through 1656 nos of STW, 4 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 10378.23 ham. SOD is 40.98%	Safe block, Arsenic affected in down to depth of 80mbgl
17. Swarupnagar	Potential aquifers encountered in the depth span of 2-17, 19-84, 90-146 mbgl. T of the aquifers is about 1200 -2000 m ² /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 12318 ham Irrigation has been done through 6989 nos of STW,17 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 3519.14 ham. SOD is 89.30%	Safe category
18. Hasnabad	in general, in the depth span of 24.00-60.00 ..	Low to medium duty (50-100 m ³ /hr), tube wells are generally feasible.	Irrigation has been done through 680 nos of STW, (as per Census 2001)	Confined aquifer In few places the aquifers down to 300 mbgl are brakish to saline in nature. Fresh ground water bearing

4.5 Status of Groundwater Development (Blockwise):

Status of Groundwater Development (Blockwise):

Block	Occurrence of Aquifers & its potentiality (as per data available with CGWB)	Feasibility of GW Abstraction Structures	Ground Water Resource Available, Irrigational draft Stage of GW development(SOD) & existing Structures (as on March'04)	Remarks
1.Amdanga	Multiple aquifer system occurs, in general, in the depth span of 36- 54, 79 -122, 146-179 mbgl, T of the aquifers is about 700 - 5000 m ³ /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 6646 ham Irrigation has been done through 2185 nos of STW & 25 no of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 2932.31 ham. SOD is 62.30%	Safe block, WL declining
2. Baduria	in general, in the depth span of 3 – 36, 42-83,94-115, 127- 152, T of the aquifers is about 700 -5000 m ³ /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible	Net GW Availability is 10911 ham Irrigation has been done through 5303 nos of STW & 20 no of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 1753.68 ham. SOD is 79.08%	Safe category WL declining
3. Bagdah	in general, in the depth span of 4.00- 86.06 and 100-184, 234- 240 mbgl, T of the aquifers is about 700 -5000 m ³ /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible	Net GW Availability is 12797 ham Irrigation has been done through 6952 nos of STW & 21 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 5638.35 ham. SOD is 87.26%	Safe category WL declining Arsenic affected in down to depth of 80mbgl
4. Barasat-I	in general, in the depth span of 5- 30,32-44,46-93,100-195,223- 259,320-329,357-364 mbgl, T of the aquifers is about 700 -5000 m ³ /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible	Net GW Availability is 5757ham Irrigation has been done through 1554 nos of STW, 19 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 2866.27 ham. SOD is 56.25%	Safe category WL declining Arsenic affected in down to depth of 80mbgl
5. Barasat-II	in general, in the depth span of 4- 37,43-48,98-107 mbgl, T of the aquifers is about 700 -5000 m ³ /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 6596 ham Irrigation has been done through 2607 nos of STW, 19 nos of DTW has been projected upto 2004 as 3414.68 ham. SOD is 71.81%	Safe category, Arsenic affected in down to depth of 80mbgl
6. Barrackpore I	in general, in the depth span of 38- 150,164-205,227-234, mbgl, T of the aquifers is about 700 -5000 m ³ /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 4876 ham Irrigation has been done through 635 nos of STW, 28 nos of DTW has been projected upto 2004 as 6515.59 ham. SOD is 41.85%	Safe category, Arsenic affected in down to depth of 80mbgl
7. Barrackpore II	In general, in the depth span of 33- 43,87-95,100-118,131-153,161-186 m bgl , T of the aquifers is about 700 - 5000 m ³ /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 2218 ham Irrigation has been done through 72 nos of STW, 14 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 6594.02 ham. SOD is 38.06%	Safe category Arsenic affected in down to depth of 80mbgl
8. Basirhat I	In general, in the depth span of 2- 26,32-82,89-115,152-180,220-262m bgl , T of the aquifers is about 700 - 5000 m ³ /d.	Low duty (20-40 m ³ /hr), and Heavy duty (50 - 150 m ³ /hr) tube wells are generally feasible.	Net GW Availability is 5448 ham Irrigation has been done through 2156 nos of STW, 4 nos of DTW (as per Census 2001) & the irrigation draft has been projected upto 2004 as 7385.76 ham. SOD is 64.39%	Safe category Arsenic affected in down to depth of 80mbgl

				confined aquifer occurs within 20 to 60 mbgl depth range.
19. Hingalganj	in general, in the depth span of 180 – 208, 250 -280 mbgl.	Low to medium duty (50-100 m ³ /hr) tube wells are generally feasible.	Irrigation has been done through 29 nos of STW, (as per Census 2001)	Confined aquifer. Above 180 mbgl saline.
20. Minakhan	in general, in the depth span of 115- 125 and 170-190 mbgl.	Low to medium duty (50-100 m ³ /hr),tube wells are generally feasible.	Irrigation has been done through 990 nos of STW, (as per Census 2001)	Confined aquifer. Above 125 mbgl brakish to saline.
21. Sandeskhal I	in general, in the depth span of 150 - 160 and 230 -290 mbg.	Low to medium duty (40-100 m ³ /hr), tube wells are generally feasible.	Irrigation has been done through 566 nos of STW, (as per Census 2001)	Confined aquifer. Above 150 mbgl saline.
22. Sandeskhal II	in general, in the depth span of 150 - 160 and 230 -290 mbg.	Low to medium duty (40-100 m ³ /hr), tube wells are generally feasible.	Irrigation has been done through 566 nos of STW, (as per Census 2001)	Confined aquifer. Above 150 mbgl saline.

5.0 Groundwater Management Strategy

5.1 Groundwater Development :

At present groundwater development in this district is mainly controlled by the shallow tubewells alongwith some deep tubewells which are very less in number. As per the Groundwater Estimation Committee,1997, the total groundwater resources for 17 blocks thus calculated is about 157640 mham. About 101005 mham is beeing withdrawn from different purposes which is about 71.19%. Thus all the 17 blocks are belongs to safe category which means further ground water development feasibility. Other 6 blocks (Hingalganj, Minakhan, Hasnabad, Sandeshkhali I & II and part of Barasat – II block) where ground water occurs in confined condition as well as upper part of the aquifer is brakish to saline, deeper aquifers may be developed by low to medium duty tube wells (50 to 150 m³ /hr discharge).

Estimation of groundwater has been calculated based on the data of shallow tubewells only. But there are sufficient deep tubewells are existing in the district which are beeing utilised for piped water supply and irrigation also. Thus development through deep tubewells may be taken up through tubewells applying cement sealing techniques particularly in the arsenic affected blocks in the district.

5.2 Water Conservation & Artificial Recharge :

Scheme for Artificial recharge is completed in overdeveloped and arsenic affected area at Khatura Bangar, Swarupnagar and Gaighata Block. Details are given in the following :

Type of structure: Excavation of silt – 69000 m³

Approved Cost : 12.02 lakhs

Implementing agency : SWID , Govt. of West Bengal

Amount utilized : 12.02 lakhs

6.0 Groundwater related issues and problems

1. Groundwater quality problem (Geogenic) : Arsenic in groundwater in sporadic manner has been identified in 19 blocks (plate). A total population of 1523560 are residing in risk zone. Arsenic concentration in groundwater varies from 0.001-3.37 mg/l. Ground water exploration of CGWB reveals that in arsenic affected area, arsenic free deep aquifers are available which are capable of yielding arsenic free water. So far CGWB has constructed 39 deep tubewells in 11 blocks which are handed over to state agencies to supply arsenic free drinking water.

Apart from this, the state govt as well as other organisations/ agencies has installed arsenic removal plants & domestic filters which are producing arsenic free water. In some part of the district surface water is being provided by the state govt.to the arsenic affected people.

However, salinity problems in south eastern part (Barast-II, Hasnabad, Hingalganj, Minakhan, Sandeshkhali I & II) of the district does exist, where fresh water aquifers underlies saline aquifer.

2. Areas having decline in water level: From the long term monitoring of water level, declining trend (38 cm / year premonsoon time) has been observed in some parts of district specially in Amdanga block.

7.0 Awareness & Training Activity

7.1 Mass Awareness Program (MAP) :

A total two no. of mass awareness programme was conducted in this district the details are given below :

Sl.No	Place/ Block	Participants	Theme
1.	Barasat/ Barasat I	175	Arsenic contamination in ground water in West Bengal and its mitigation
2.	Asoknagar/ Habra	180	Ground Water Development & Management in arsenic infested areas with scope for Rain Water Harvesting

7.2 Ground Water Management Training Programme (WMTP) :

One Ground Water Management Training Programme was conducted in this district the detail is given below

Sl.No	Place/ Block	Participants	Theme
1.	Asoknagar/ Habra	14	Ground Water Development & Management in arsenic infested areas with scope for Rain Water Harvesting

7.3. Exhibition/ Mela/ Fair etc :

Sl.No	Place/ Block	Organiser	objective
1.	Thakurnagar/Gaighata	Thakurnagar book fair committee	To aware people regarding the activities of CGWB
2.	Madhyamgram/ Barasat I	Madhyamgram Municipality	To aware people regarding Ground water development and managements in arsenic affected areas in N-24 Parganas
3.	Baguihati/ Rajarhat	Science and cultural organization for youth	To aware people regarding the activities of CGWB

8.0 Area Notified by CGWB/ SGWA

List of area : Nil

9.0 Recommendations

- At present district has ground water resources of 157640 mham of which gross ground water draft is 101005 mham which it self indicates that present stage of GW development is nearly 71.19%. Therefore it is essential to take cautious approach for further ground water development of the district as a whole.
- In arsenic infested blocks ground water used for drinking purposes by identifying arsenic free tubewells as well as from arsenic free deeper aquifers and tubewells which should be properly designed by adopting cement sealing techniques. Ground water from contaminated aquifer may be used after properly treated through arsenic removal units and same may be periodically monitored.
- Rainwater harvesting techniques (construction of recharge shaft with percolation tank) may be adopted for artificial recharge specially in Amdanga block, where water level is declining and other blocks where saline water underlies fresh water. In this regards Roof top rain water harvesting techniques can be followed for water conservation and in places for artificial recharge.

4. Cropping Pattern can be changed and crops with low water requirement (e.g., sun flower cultivation) can be adopted in Amdanga block.
5. Modern irrigation practice , such as, sprinkler and drip irrigation,should be adopted to minimize the use of ground water specially in Amdanga block.
6. Change the nature of psiculture from saline water to fresh water, by checking the intrusion of saline/brakish water from rivers specially during high tide period , by introduction of salt tolerant crop may be a good remedial measures in Barasat II where saline water underlies fresh water.