

**DISTRICT AT A GLANCE**

<b>Sl. No.</b>	<b>Items</b>	<b>Statistics</b>
<b>1.</b>	<b>GENERAL INFORMATION</b>	
	i) Geographical Area (Sq. km.)	3140
	ii) Administrative Division	
	• No. of Subdivision (as on 2004)	2nos.
	• No. of Blocks (as on 2004)	9 nos.
	• No. of Municipalities (as on 2004)	4 nos.
	• No. of Inhabited villages (as on 2001)	1477 nos.
	iii) Population (as on 2001 Census) (with density of population)	2441794 (778 per sq.km.)
	iv) Normal Annual Rainfall (mm)	2042
<b>2.</b>	<b>GEOMORPHOLOGY</b>	
	Major Physiographic Units	<b>Altitude:</b> <b>Land slope:</b> A general southern slope, which is approximately of 1-3 m/km in the northern part becomes very gentle in the southern part. <b>General Gradient:</b> N-S.
	Major Drainages	River Mahananda
<b>3.</b>	<b>LAND USE (Sq.km.) (as on 2004-05)</b>	
	a) Forest Area	5.8
	b) Net Area Sown	2696
	c) Cultivable Area	2797.09
<b>4.</b>	<b>MAJOR SOIL TYPES</b>	Sandy loamy soil (slightly to highly acidic), gangeitic soil (rich in calcium & mildly acidic to alkaline), 'Khar' soils (heavy clay to clay loam, neutral to slightly acidic).
<b>5.</b>	<b>AREA UNDER PRINCIPAL CROPS (Sq.km.) (As on 2004-05)</b>	Total Cereals: 3249 Total Pulses: 51 Total Oilseeds: 414 Total Fibre: 676 Total Miscellaneous Crops: 117
<b>6.</b>	<b>IRRIGATION BY DIFFERENT SOURCES (as on 2004-05) (Areas &amp; No. of Structures)</b>	
	Tube wells/ Bore wells	214.75 sq. km. area irrigated through 51538 nos. of tube wells.
	Tanks/ Ponds	59.7 sq.km. area irrigated through 10456 nos. of tanks.
	RLI	52.8 sq. km. area irrigated through 132 nos. of RLI.
	Canals	22 sq.km. area irrigated through Govt. Canals.
	Gross Irrigated Area	3165.40 sq.km.
<b>7.</b>	<b>NUMBERS OF GROUND WATER MONITORING WELLS OF CGWB (As on 31.03.07)</b>	16 12 04
	No. of Dug wells	
	No. of Piezometers/ Tube wells	
<b>8.</b>	<b>PREDOMINANT GEOLOGICAL FORMATIONS</b>	Crystalline basement, Older Alluvium (Barind tract), Recent fluvial deposits
<b>9.</b>	<b>HYDROGEOLOGY</b>	
	➤ Major Water bearing formation	Recent Alluvium consists of coarse to fine sand and gravel

	➤ Pre-monsoon depth to water level during 2006	2.47 - 5.64 mbgl
	➤ Post-monsoon depth to water level during 2006	0.53 – 5.39 mbgl
	➤ Long term water level trend in 10 years (1997-2006) in m/yr	
10.	<b>GROUND WATER EXPLORATION BY CGWB (As on 31.03.07)</b>	
	No. of wells drilled	13
	Depth Range (m)	34 – 243
	Discharge (lps)	7 - 80
	Storativity (S)	
	Transmissivity (m <sup>2</sup> /day)	400 - 2000
11.	<b>GROUND WATER QUALITY</b>	
	Presence of Chemical constituents more than permissible limit	Fluoride concentration 1.84 mg/l in Itahar block.
	Type of water	Potable
12.	<b>DYNAMIC GROUND WATER RESOURCES (2004)-IN MCM</b>	
	Net Ground Water Availability	1536.86
	Existing Ground Water Draft for all uses	722.65
	Projected Demand for Domestic and Industrial Uses after 2025	58.08
	Stage of Ground Water Development	47.02 %
13	<b>AWARENESS And Training ACTIVITY</b>	
	Mass Awareness Programmes Organized	
	Date	13. 02. 2006
	Place	Raiganj, Uttar Dinajpur
	No. of Participants	119
	WATER MANAGEMENT TRAINING PROGRAMME ORGANIZED	
	Date	14. 02. 2006
	Place	Raiganj, Uttar Dinajpur
	No. of Participants	26
14	<b>EFFORTS OF ARTIFICIAL RECHARGE &amp; RAINWATER HARVESTING</b>	
	Projects completed by CGWB (No. & Amount spent)	Nil
	Projects under technical guidance of CGWB (Numbers)	Nil
15	<b>GROUND WATER CONTROL AND REGULATION</b>	
	No. of OE Blocks	Nil
	No. of Critical Blocks	Nil
	No. of Blocks notified	Nil
16	<b>MAJOR GROUND WATER PROBLEMS AND ISSUES</b>	Sporadic occurrence of fluoride in Itahar block

## **1.0 INTRODUCTION :**

The District Uttar Dinajpur formed by Gazette Notifiction No.177 L.R./6M-7/92 dated 28.02.1992 and the District came into existence on 1st April,1992.The District is located in the north of West Bengal and geographically looks like chicken's neck. The District is butted and bounded by Bangladesh on the East (length of border 227 K.M.), Bihar on the West, Darjeeling and Jalpaiguri on the North and Malda on the South. The NH-34 and NH-31 passes through the District. The name of the District originated from the name of king 'Danuj' and therby Danaj and ultimately converted to Dinaj. This is a multi-lingual district dominated by Bengali speaking and there are urdu and Hindi speaking population in the Islampur area. The district has 9 blocks, 4 municipalities & 99 Gram panchayats. There are two sub divisions in the district like Raiganj and Islampur. Raiganj, which is situated in the southern part of the district, is the district Head Quarters. As per 2001 census the total population is 2441794 in the district with the density of 778 per sq km.

Uttar Dinajpur District is connected both by Railway & by National Highway (NH 34) with State Capital Kolkata and the distance is about 409 k.m. Latitude and Longitude of Uttar Dinajpur is 26°35'15"N and 87°48'37" W. The district is connected of North Bengal and the North-Eastern States to the rest of India. The nearest airport is at Bagdogra at Siliguri.

The district is a part of Gangetic plain and is covered by the drainage system of perennial rivers originating from the Himalayas. The main river Mahananda forms the northern boundary of the district and ultimately joins with the river Ganga. The other important tributaries like Tangon, Gamari, Nagar, Kulik, Sui, Dauk, Sudani, Mohona are flowing southerly as per the slope the country. The rivers are in full flow during monsoon only and the flow is sustained by base flow along their channels during the rest of the period.

Aman, Aus, Boro, Wheat, Barley, Maize, Cereals, pulses, oil seeds are the major crops in the district. The area under principal crops in Uttar Dinajpur district during 2004 – 2005 is as under.

(Thousand Hectares)

Rice	Wheat	Barley	Maize	Cereals	Pulse	Oil	Jute	Mesta	Potato	Tea	Chillies	Ginger
269.2	45.5	0.1	8.3	324.9	5.141	63.5	63.5	4.1	7.6	0.3	3.1	0.7

Use of heavy duty tubewells, medium duty tubewells, shallow tubewells, river lift irrigation, canals and other sources are the common practice in irrigation. Total 139000.64 hectares have been irrigated during 2004-05.Teesta Barrage Project, the main irrigation project is under construction in the district.

## **Previous Work :**

The district has been covered by systematic hydrogeological survey conducted by Geological Survey of India (GSI) and Central Ground Water Board (CGWB). The district as a whole has been covered by Reappraisal Hydrogeological Survey by CGWB. Ground Water Exploration programme has been taken in the district by CGWB.

## **2.0 RAINFALL & CLIMATE**

The district is located in the north of tropic of cancer and therefore it is not hot and humid like other southern parts of the state. Nights are cooler in the northern part and the climate varies from north to

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Ground water occurs in the unconfined condition in the shallow aquifers and under unconfined to semi-confined condition in deeper aquifers, the latter being particularly common in Kaliaganj, Raiganj, Hemtabad and Karandighi blocks. Dug wells, shallow tubewells (low duty tubewells) and deep tubewells (heavy duty tubewells) are the ground water structures available in the district. Dug wells tapping the unconfined aquifer are mainly in the depth range of 5 -10 mbgl. Deep tube wells tapping the unconfined to semi-confined aquifers are not plenty (only 191) in the district and the depth range varies from 50-307 mbgl. Thin clay beds have separated the unconfined aquifer from deeper aquifer (semi-confined).

In northern part of the district mainly Chopra, Islampur and Goalpokhar I & II blocks a single unconfined highly potential aquifers exists within 100 m or more under a thin soil cover. Shallow tube wells which were constructed within 50 mbgl tapping unconfined aquifers are capable of discharging 100 m<sup>3</sup>/hr. The depth of heavy duty tubewells yielding upto 200 m<sup>3</sup>/hr, are in the range of 50-100 mbgl. The specific capacity of the tubewells is maximum in Raiganj, Karandighi, Hemtabad and Goalpokhar I & II, which decreases towards north and south. The decrease in specific capacity of the tubewells may be due to the nature of admixture of coarse with finer clastics resulting in poor sorting and poor permeability.

The form and slope of the water table is similar in both the periods with parallel disposition of contours. Ground water flows uniformly towards south and southwest. The slope of the water table is comparatively steeper in the northern part. Water table in pre-monsoon rests between 67 mamsl and 23 mamsl and in post-monsoon rests between 26 mamsl and 70 mamsl. It is found that the water levels in the district varies between 2.47 and 5.64 m bgl during pre-monsoon period and 1.67 and 4.32 mbgl during post-monsoon period.

Generally it is observed that depth to water level is within 2 - 5 mbgl in entire district except in the southern part of Itahar block, where depth to water level varies between 5 - 10 mbgl. The decadal fluctuation (1994-2003) of water level during pre-monsoon and post-monsoon period varies between 0-2 mbgl. The decadal fluctuation of water level shows a rise in the entire district to the tune of 0-2 mbgl except some small patches in parts of Goalpokhar I & II, Chopra, Islampur, Hemtabad, Itahar blocks.

## 5.2 GROUND WATER RESOURCES :

The dynamic ground water resources of Uttar Dinajpur 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.

All the 9 blocks of Uttar Dinajpur district are under safe category. The reconciled figures are as under:

▪ Net Ground Water Availability	153686 ham
▪ Existing Gross Ground Water Draft for Irrigation	68657 ham
▪ Existing Gross Ground Water Draft for Domestic and Industrial Water Supply	3608 ham
▪ Existing Gross Ground Water Draft for all Uses	72265 ham
▪ Allocation for Domestic and Industrial Requirement Supply upto Next 25 Years	5808 ham
▪ Net Ground Water Availability for Future Irrigation Development	79221 ham
▪ Stage of Ground Water Development	47.02 %

### **5.3 GROUND WATER QUALITY :**

The chemical quality of ground water has an important role for supplying water for drinking, irrigational and industrial uses in the society. The supplying quality of ground water in the district is uniformly good for drinking, irrigational and industrial purposes. The chemical analysis of the collected samples in the ER revealed that the quality of ground water is suitable for drinking purpose and pH, TDS, Cl, Ca, Mg, and SO<sub>4</sub>.

The range of specific conductance of water in the district ranges from 92 to 755  $\mu\text{s}/\text{cm}$  at 25°C which proves good quality of water for irrigation purpose. The nitrate concentration in ground water varies between 1.29 – 28 mg/l. The fluoride concentration in ground water in the district varies below detectable limit except Itahar block where the concentration is reported as 1.84 mg/l.

### **6.0 GROUND WATER MANAGEMENT & STRATEGY & RECOMMENDATION :**

#### **6.1 Ground Water Development**

In Uttar Dinajpur district, the thickness of alluvium increases gradually from south to north. The development of ground water may be done through different ground water abstraction structures considering the occurrence of the potential & potable ground water aquifers and stage of ground water development.

It has been observed that the potentiality of the aquifers in the southern part of Itahar block is low and the scope of ground water development is limited in this area.

Maximum ground water exploitation has been done through open wells & shallow tubewells. The depth of the open wells varies from 4-10 mbgl, whereas the shallow tubewells are generally constructed down to the depth of 40 mbgl. A few deep tubewells of depth ranges between 50-300 mbgl, have been constructed for irrigation purpose. The depth of the tubewells may be restricted down to the depth of 150-200 mbgl tapping the aquifers. Both shallow and deep tubewells are feasible in all the blocks of the district, while shallow ground water structures including dug wells are particularly suitable in the northern blocks. Deep tubewells are suitable in the southern sector for effective utilization of ground water for irrigation purposes.

#### **6.2 Water Conservation & Artificial Recharge:**

No structure has been constructed by CGWB till date. Generally water conservation & artificial recharge is feasible in such area where water level is more than 3 mbgl in post monsoon period. As a whole the water level is not so in alarming condition, except in Itahar, Hemtabad & Kaliaganj blocks of the district, where conservation of rainwater by different structures like percolation tank, roof top rain water harvesting for conservation may be adopted.

### **7.0 GROUND WATER RELATED ISSUES & PROBLEMS**

The sporadic occurrence of fluoride more than permissible limit (1.5 ppm) in ground water has been observed in Itahar block of the district. The maximum concentration of fluoride in ground water is reported as 1.84 ppm in certain localities of Itahar block within 100 mbgl.

### 5.2 STATUS OF GROUND WATER DEVELOPMENT (BLOCKWISE)

Block	Occurrence of aquifers & its potentiality (as per data available with CGWB)	Feasibility of GW abstraction structures	GW resources available & status of GW Development (as on March '04)	Remarks
Chopra	In general potential aquifer occurs in alluvium within 170 mbgl (100-135 mbgl and 145-165 mbgl).	In general low duty tubewells are feasible tapping the granular zones upto 50 mbgl and medium duty tubewells are feasible tapping granular zones within the depth span of 170 mbgl with yield upto150 m <sup>3</sup> /hr with a draw down of 4 m.	Net GW Availability: 14337 ham Irrigation draft : 3162 ham No. of Irrigation well (as per Census 2001): STW - 1784 DTW - 12	
Islampur	In general potential aquifer occurs in alluvium within 250 mbgl (35-55 mbgl, 155-165 mbgl, 170-200 mbgl and 220-235 mbgl) with T value 800-1600 m <sup>2</sup> /day.	In general shallow,medium duty tubewells are feasible. Tubewells tapping granular zones of 30 m within the depth span of 250 mbgl may yield 200 m <sup>3</sup> /hr with a draw down of 3-4 m.	Net GW Availability: 12577 ham Irrigation draft : 3396 ham No. of Irrigation well (as per Census 2001): STW - 1875 DTW - 12 DW - 2	
Goalpokhar I	Potential aquifer in the area occurs in alluvium in the depth span of 60-100 mbgl.	In general medium to heavy duty tubewells are feasible. Tubewells tapping granular zones within the depth span of 60-100 mbgl may yield 200 m <sup>3</sup> /hr with a draw down of 2-3 m.	Net GW Availability: 16272 ham Irrigation draft : 4748 ham No. of Irrigation well (as per Census 2001): STW - 2735 DTW - 14	
Goalpokhar II			Net GW Availability: 12508 ham Irrigation draft : 6247 ham No. of Irrigation well (as per Census 2001): STW - 3711 DTW - 10	

Karandighi	Potential aquifer in the area occurs in Recent alluvium in the depth span of 15-100 mbgl.	In general medium to heavy duty tubewells are feasible. Tubewells tapping granular zones between 30-100 mbgl may yield 200 m <sup>3</sup> /hr with a draw down of 5 m.	Net GW Availability: 20808 ham Irrigation draft: 9551 ham No. of Irrigation well (as per Census 2001): STW - 5588 DTW - 9	
Raiganj	In general aquifers occur in alluvium within 250 mbgl (85-110 mbgl and 210-250 mbgl). The potential aquifers occur within 110 mbgl with T value of 1300 m <sup>2</sup> /d but the potentiality of the aquifers gradually decreases downwards. The deeper aquifer within 210-250 mbgl shows T value of 500 m <sup>2</sup> /d.	In general low duty tubewells are feasible tapping the granular zones upto 50 mbgl and medium to heavy duty tubewells are feasible tapping granular zones within the depth span of 100 mbgl with yield upto 200 m <sup>3</sup> /hr with a draw down of 2 m. Whereas the yield of the tubewells tapping the deeper aquifer within 250 mbgl may yield within 100 m <sup>3</sup> /hr with drawdown upto 10 m.	Net GW Availability: 23155 ham Irrigation draft: 13199 ham No. of Irrigation well (as per Census 2001): STW - 7900 DTW - 21	
Hemtabad	In general potential aquifers occur in alluvium within 110 mbgl (70-85 mbgl and 95-110 mbgl) against the drilled depth of 250 mbgl.	In general low duty tubewells are feasible tapping the granular zones upto 50 mbgl and medium duty tubewells are feasible tapping granular zones within the depth span of 100 mbgl with yield upto 200 m <sup>3</sup> /hr with a draw down of 2 m.	Net GW Availability: 11397 ham Irrigation draft: 7055 ham No. of Irrigation well (as per Census 2001): STW - 4116 DTW - 21	
Kaliaganj	Potential aquifer occurs in alluvium in the depth 35-55 mbgl, 75-95 mbgl, 185-195 mbgl and 210-220 mbgl with T value 1000 m <sup>2</sup> /day.	In general low duty tubewells are feasible tapping the granular zones upto 50 mbgl and medium duty tubewells are feasible tapping granular zones within the depth span of 100 mbgl with yield upto 200 m <sup>3</sup> /hr with a draw down of 2 m. Whereas the yield of the tubewells tapping the deeper aquifer within 250 mbgl may yield within 100 m <sup>3</sup> /hr with	Net GW Availability: 19834 ham Irrigation draft: 9584 ham No. of Irrigation well (as per Census 2001): STW - 5490 DTW - 30	

		drawdown upto 10 m.		
Itahar	The potential aquifer occurs in Recent alluvium within 50 mbgl and 155-200 mbgl.	In general low to medium duty tubewells are feasible tapping the granular zones in the area. The yield of the tubewells is comparatively low with higher drawdown particularly in the southern part of the block.	Net GW Availability: 22797 ham Irrigation draft: 11714 No. of Irrigation well (as per Census 2001): STW - 7079 DTW - 15	The fluoride concentration in ground water in the district is below detectable limit except Itahar block where the concentration is reported as 1.84 mg/l.

**Municipality wise status of water supply in Uttar Dinajpur District:**

Sl. No.	Municipality	Status of water supply
1	Raiganj	Large dia tubewells alongwith DTW, STW, spot sources, street stand post etc are being used to cater the water in Raiganj Municipality with 10.64 sq.km area & 165222 population (Census 2001).
2	Kaliaganj	Large dia tubewells alongwith Pvt.TW, spot sources, strand post etc are being used to cater the water in Kaliaganj Municipality with 11.67 sq.km area & 47639 population (Census 2001).
3	Dalkhola	Large dia tubewells alongwith hand pump fitted TW, street stand post etc are being used to cater the water Islampur Municipality with 2.12 sq.km area & 29772 population (Census 2001).
4	Islampur	Large dia tubewells alongwith hand pump fitted TW, street stand post etc are being used to cater the water Islampur Municipality with 16.50 sq.km area & 52766 population (Census 2001).

## **8.0 AWARENESS & TRAINING ACTIVITY**

### **8.1 Mass Awareness Programme (MAP) & Water Management Training Programme (WMTP) by CGWB :**

<b>Programme</b>	<b>Place</b>	<b>Date</b>	<b>No. of Participants</b>	<b>Theme</b>
MAP	Raiganj, Uttar Dinajpur district	13.02.2006	119	Rain Water Harvesting
WMTP	Raiganj, Uttar Dinajpur district	14.02.2006	26	Ground Water Development & Management with special reference to Rain Water Harvesting

### **8.2 Participation in Exhibition, Mela, Fair etc. : NA**

### **8.2 Presentation & Lectures delivered in public forum/ Radio/T.V/Institution of repute/Grassroots associations/NGO/Academic institutions etc.**

## **9.0 AREAS NOTIFIED BY CGWA/SGWA:**

No area of Uttar Dinajpur district has been notified by CGWA/SGWA

## **10 RECOMMENDATIONS:**

- As all the 9 blocks in the district are categorized as "Safe", large scope for ground water development may be done in agricultural, domestic and industrial field through different structures considering optimum command area of the abstraction structures.
- Both shallow and deep tubewells are feasible in all the blocks of the district. While shallow ground water structures including dug wells are particularly suitable in the northern block, deep tubewells will have to be constructed in the southern sector for effective utilization of ground water for irrigation purposes.
- Rooftop rain water harvesting and conservation of rain water by different conservation structures particularly in southern part of the district should be encouraged.