

GROUND WATER BROCHURE OF JAUNPUR DISTRICT, U.P.

AAP:2012- 2013

By

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DISTRICT AT GLANCE

1. GENERAL INFORMATION

i. Geographical Area (Sq. Km.)	: 4038
ii. Administrative Division (as on 31.3.2012)	
a) Number of Tehsil	: 6
b) Number of Block	: 21
c) Number of Nyaya Panchayat	: 218
d) Number of Village	: 3386
iii. Population (as on 2011 census)	: 1596909
iv. Average Annual Rainfall (mm)	: 987

2. GEOMORPHOLOGY

Major Physiographic Units : The district is part of Central Ganga Plain with almost flat topography with gentle sloping land towards southeast it is divided into two units (i) Upland region and (ii) Lowland region.

Major drainage : Gomati and Sai are the main rivers. Varuna and Basuhi are other two rivers which unite in the extreme south and discharge into **Ganges**.

3. LAND USE (Ha.)

a) Forest area	: 99
b) Net area sown	: 278527
c) Net irrigated area	: 243519

4. MAJOR SOIL TYPES	: Transported; alluvial soil consisting sand silt and clay in varying proportions.
5. AREA UNDER PRINCIPAL CROPS (As on 2010)	: Rabi :234213
Ha.	Kharif : 220661
	Zaid : 6417

6. IRRIGATION BY DIFFERENT SOURCES

(Areas in ha. and Number of Structures)

Dug wells	:
Bore wells 475 Nos.	: 6134
Tanks / Ponds	: 0

Canals (Length = 1698 Km) : 64867
 Other sources : 0
 Net Irrigated Area : 243519
 Gross Irrigated Area : 382353

7. NUMBER OF GROUND WATER MONITORING WELLS OF CGWB (As on 2009)

No. of Dug wells : 23
 No. of Piezometers : 02

8. PREDOMINANT GEOLOGICAL FORMATIONS

: Gangetic Alluvium of Pleistocene to Recent time. Consists of inter bedded layers of sand, silt and Clay with occasional appearance of Kankar. Maximum thickness explored is 752 mbgl.

9. HYDROGEOLOGY AND AQUIFER GROUP

: District lies in the part of Ganga-Ghagra interfluvial belt. Ground water occurs in thick zone of saturation of unconsolidated sediments. Two-tier aquifer system prevails;

I Tier	Ground level to 50 meter, Phreatic
II Tier	150m to Vindhyan basement, (below the top clay layer), ranging from 200 to 400 meters, Confined.

Major water bearing formation :

(Pre-monsoon Depth to water level during May' 2012) : 2.13 to 15.48 mbgl
 (Post-monsoon Depth to water level during Nov' 2012) : 0.60 to 15.10 mbgl
 Long term of water level trend in 10 years (2003-2012) : Rise = 0.0075 to 0.1382
 in m/year : Fall = 0.0116 to 1.1101

10. GROUND WATER EXPLORATION BY CGWB (As on 2012)

No. of wells drilled (EW, PZ, Total) : EW-14, PZ-02
 Depth Range (m) : 30.00-752.00 mbgl

	Discharge (liters per minute)	: 150-4800
	Storativity (S)	: N.A.
	Transmissivity (m ² /day)	: 1390 to 7610
11.	GROUND WATER QUALITY	
	Presence of Chemical constituents more than permissible limit (e.g. EC, F, NO ₃ , As, Fe)	: F>1.8mg/l at Shahganj block.
	Type of water	Good water quality zone
12.	DYNAMIC GROUND WATER RESOURCES (2009)-in HAM	
	Annual Replenish able Ground Water Resources	: 151073.62
	Gross Annual Ground Water Draft	: 107250.75
	Projected Demand for Domestic Industrial Uses up to 2033	: 15979.60
	Stage of Ground Water Development	: 77.72%
13.	AWARENESS AND TRAINING ACTIVITY	:
	Mass Awareness Programmes organized	: Nil
	Date	
	Place	
	No. of Participants	
	Water Management Training Programme (Artificial Recharge) organized	
	Date	:
	Place	:
	No. of Participants	:
14.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING	
	Projects completed by CGWB (No of Amount Spent)	: NA
	Projects under technical guidance of CGWB (Numbers)	: NA
		:
15.	GROUND WATER CONTROL AND REGULATION	
	Number of OE blocks	: 04

Number of critical blocks : 03

Number of blocks notified : Nil

Number of semi critical blocks :05

- 16. MAJOR GROUND WATER PROBLEMS AND ISSUES** : The analysis of NHS data indicates that in most of the blocks declining trend has been observed. Falling trend is maximum in Buxa block. High NO₃ concentration up to 664mg/l has been observed in the city of Jaunpur in shallow aquifer. High Floride has been observed in Shahganj block.

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1.0 INTRODUCTION

Jaunpur district was carved out of Allahabad and lies between 25⁰22'30'' and 26⁰10'00'' north latitude and 82⁰06'00'' and 83⁰00'00'' east longitude in survey of India toposheet 63K and 63J. Total geographical area of the district is 4038 sq. km. District headquarter is at Jaunpur having 06 number of tehsils and 21 number of blocks. As per the 2010 census the district has population of 1596909 of which 838095 males and 758814 females. Scheduled caste population is 196040 and scheduled tribe population is 60. Literacy rate of the district is 63.05%.

Geographically the area comprises Quaternary alluvium sediments heterogeneous in nature are deposited over the concealed basement of Vindhyan sandstone and shale of varying thickness. The main and major drainage of the district belong to the Ganga river system of which river Gomti and Sai are tributaries.

Physiographically the area can be divided into two units –

- (1) Up-Land region
- (2) Low Land region

Agriculture is the main source of economy of the district. Both surface and ground water are used for irrigation. The net irrigated area is 243519 Ha and the net area sown is 278527 Ha, which shows that 87% area is irrigated and the rest area depends on rainfall. Length of canal in the district is 1698 Km. and the number of government tube wells is 475.

Jaunpur district is drained by Ganga river system of which Gomti and Sai are tributaries. The Gomti enters the district through north western border where as Sai first touches the district in the north western corner takes south east turn near Buxa and ultimately joins Gomti.

The district was covered under hydrogeology and ground water potential study by geologists of GSI and CGWB. Ground water management study by Shri T.K.Pant in 2005-06.

2.0 RAINFALL & CLIMATE

The average annual rainfall is 987 mm. The climate is typical sub humid punctuated by long and intense summer and cold winters. About 88% of the annual rainfall is received from south-west monsoon. May is the hottest month with temperature shooting up to 46.5⁰C. With the advance of monsoon by about mid June, temperature starts decreasing. January is usually the coldest month with the temperature going up to 5.6⁰C.

The relative humidity is highest during south-west monsoon ranging between 55% to 82% with its lowest around 32% during peak summer months of April and May.

3.0 GEOMORPHOLOGY & SOIL

3.1 Geomorphology:

The district is a part of Central Ganga plain, characterized by mainly two geomorphic units i) Upland region ii) Low land region. The average elevation of the land ranges from 60m.a.m.s.l in east to 95 m.a.m.s.l in the west. Based on the hydro geomorphic map of the district by IRS-1A and LISS-II imagery the following units have been identified.

i) Ravinous Land(RA):

A post gully formation due to surface runoff erosion in alluvium along rivers like Sai, Gomti, and Basuhi etc. Presented by unconsolidated alluvium. The unit has good ground water prospect.

ii) Younger Alluvium Plain(APY):

This is flat gently sloping plain formed of sediments carried by river Gomti and Sai. This comprises of younger unconsolidated material of later cycle of deposition. This has good to excellent ground water prospect.

iii) Alluvial plain with salinity(SAL):

This is observed in patches in Rampur, Barsathi, Jaunpur and Dhobi blocks. Shallow aquifer in this area has poor water quality.

iv) Older Alluvial Plain(APO):

These occur as extensive palio channels forming very good spots for ground water occurrence. The area lies north and south of Sai and Gomti rivers. Older alluvium refers to cycle of deposition.

3.2 Soil:

Soils of the district are mainly transported i.e. alluvial soil, comprising sand silt and clay in varying proportions. The alluvial soils of the district are subdivided into older alluvial soil and younger alluvial soil. The older alluvial soil occupies high land wherever, the younger soils are restricted to marginal tracts only.

3.3 Geological set up:

The Geological setup of the district comprises of Gangetic alluvium which was deposited from Pleistocene to recent. It consists of inter bedded layers of sand, silt and clay with occasional appearance of Kankar. These sediments are clastic in nature and belong to middle to upper Pleistocene period of deposition by existing drainage system overlying directly on Vindhyan group. The new alluvial sediments are confined to present drainage system forming the flood plain deposit. The Geological succession is as follows.

GEOLOGICAL SUCCESSION

Age	Formation	Litho logy
Upper Pleistocene to recent.	New Alluvium	Unconsolidated sand, silt and clay
Middle to Upper Pleistocene	Old Alluvium	Consolidated clay with Kankar, sand of fine to medium with gravel.
Vindhyan	Kaimur Formation	Sand stone, gray to white buff, arkosic with lime stone and quartzite.

4.0 GROUND WATER SCENARIO

4.1 HYDROGEOLOGY:

Depth To Water Level: Depth to water level(DWL) data collected from Ground Water Monitoring Wells in May' 2012 and Nov' 2012 have been utilized to prepare depth to water level contour maps.

Table: Water Level and Fluctuation (Pre & Post-monsoon) for the year 2012

Sl. No.	Ground Water monitoring well	Block	Pre-monsoon DWL (May' 12) (mbgl)	Post-monsoon DWL (Nov' 12) (mbgl)	Fluctuation (m)
1.	Machlisahar	Machlisahar	2.13	0.65	1.48
2.	Shahganj	Shahganj	4.75	0.90	3.85
3.	Mahreon		3.32	2.27	1.05
4.	Maharajganj	Maharajganj	7.90	2.47	5.43
5.	Honipur	Sujanganj	8.69	7.45	1.24
8.	Muftiganj	Muftiganj	12.17	-	-
9	Rampur	Rampur	9.56	6.93	2.63
11	Khetasarai	Shahganj	5.17	3.54	1.63
13	Chandwak	Dobhi	15.48	15.10	0.38
16	R.Bajar	Maharajganj	9.12	3.68	5.44
17	Sigramau	Sigramau	8.43	4.75	3.68
19	Dhiuraha		12.25	12.25	00.00
20	Hasanpur		6.74	5.28	1.46
25	Tarti		6.94	6.15	0.79
27	Pisara	Muftiganj	2.84	1.27	1.57
30	Sarpatha	Suethakalan	3.43	2.27	1.16
31	Marhyaun	Marhyaun	5.74	3.10	2.64
32	M.Badshapur	M.Badshapur	8.75	4.25	4.50
35	N.Jamnipur	M.Badshapur	2.54	0.60	1.94

36	Bandhawa	Barsathi	7.88	5,31	2.57
37	Janghai	M.Badshapur	6.45	0.83	5.62
38	Maheshganj	Marhyaun	6.13	0,94	5.19
39	Baraipar		8.74	1.18	7.56

A perusal of the table and depth to water level contour map for the period May'2012, reveal that water level varies from 2.13 mbgl as seen in Machlisahar in Machlisahar Block to 15.48 mbgl in Chandwak in Kirakat block. Almost all the blocks, covering approximately 50% of the wells show DWL between 05 to 10 mbgl. 25% of the wells show DTWL between 0 to 5mbgl. The data reveal that no well is showing $DWL < 2$ mbgl.

A perusal of the table and depth to water level contour map for the period November' 2012 reveal water level has become shallower and varies from 0.60 mbgl inMachlisahar block to 15.10 m in Chandwak block. The data reveal that some areas are prone to water logging. About 50% of the wells show DTWL in 0-3 mbgl.

Seasonal Fluctuation:

Water Level/table fluctuates in response to recharge to the aquifer and withdrawal from the aquifer. The quantum of fluctuation is a direct function of the above. Recharge takes place mainly during rainy season. The minimum depth to water level in an area is expected sometime at the close of monsoon or in the middle of monsoon period depending upon the intensity and duration of rainfall as well as soil characteristics and maximum depth to water level is expected to be just before the rainfall. The part of the rainfall in the initial period goes towards meeting the soil moisture deficiency as well as to saturate the Evaportranspiration losses.

Annual Seasonal Fluctuation of Water Level

Annual Seasonal Fluctuation of Water Level has been determined from the Pre-monsoon (May'2012) and Post-monsoon (Nov'2012) water level data of Ground

Water monitoring wells. The fluctuation varies from min 0.0 mbgl to max 7.56 mbgl in Dhiuraha and Baraipur in Khutan block .

Long term trend of water level

Table shows the long term trend of water level of Ground Water monitoring wells for ten year period 2003 to 2012.

S/n	Location	Premonsoon rise (m/yr)	Premonsoon Fall (m/yr)	Postmonsoon rise(m/yr)	Post monsoon Fall(m/yr)	Annual Rise (m/yr)	Annual Fall (m/yr)
1	Machlisahar		0.0215		0.0201	0.0106	
2	Shahganj		0.0331	0.1753		0.1382	
3	Badlapur		0.2559		0.7432		0.2279
4	Maharajganj		0.2837		0.1622		0.2299
5	Honipur		0.1067	0.0493			0.0316
6	Buxa		1.2877		1.4140		1.1101
7	Muftiganj		0.7206		0.3645		0.7496
8	Rampur		0.6425		0.4673		0.4507
9	Khutan		0.5252		0.2223		0.5238
10	Khetasarai		0.0204		0.0069	0.0075	
11	Chandwak		0.5940		0.6518		0.6459
12	Mehreon	0.0383		0.0347		0.0080	
13	Sikrara			2.3278			
14	Belwal		0.3159		0.3163		0.1469
15	Rajabazar		0.5323		0.1879		0.2394
16	Sigramau		0.3023		0.0720		0.1717
17	Baraipar		0.2442		0.0455		0.1198
18	Dhiuraha		0.3043		0.0720		0.1717
19	Hasanpur		-		0.0562		0.0907
20	Dinamau		0.5973		0.6671		0.7052

21	B.Dasmi		0.4666		-		-
22	G.Bazar	0.6821			0.4844		0.1517
23	Tarti		0.3701		0.3402		0.2998
24	Chakwa		0.6090		0.2322		
25	Pisara		0.0434	0.0429			0.0116
26	Shankarganj		0.5930		0.6494		0.5892
27	Chitwan		0.6192		0.8170		0.7198
28	Sarpatha		0.0777		0.0455	0.0214	
29	Mariyahun		0.1228		0.0192		0.0626
30	M.Badshapur		0.2586		0.2127		0.2025
31	Barsathi		0.4362		0.9513		
32	Madhupur	0.0576			1.0493		0.4529
33	N.Jamnipur	0.0161		0.1006		0.0669	
34	Bandhwa		0.1717		0.0948		0.1527
35	Janghai		0.2867		0.0274		0.1400
36	Maheshganj		0.2831	0.0757			

Long Term Water Level Trend: Pre-monsoon trend of water level

A perusal of the table shows that there is falling trend in majority of the wells during Pre-monsoon period. The range of decline is 2.04 cm/year at Khetasarai in Shahganj block to 128 cm/year at Buxa in Buxa block block.

Table – DWL Trend during Pre-monsoon period (2003 to 2012)

Sl.No.	No. of wells analyzed	No. of wells showing declining Trend	No. of wells showing decline of					
			0-20 cm/yr	20-30 cm/yr	30-40 cm/yr	40-50 cm/yr	50-60 cm/yr	>60 cm/year
1.	36	31	08	06	04	03	05	05

Almost 26% of wells are showing decline in the range of 0-20cm/year. Rest of the wells fall in the more than20 cm/yr category.

Post-monsoon trend of water level

A perusal of the table shows that there is falling trend during Post-monsoon period in all the wells. The range of decline is 0.0069 cm/year at Khetasarai to 2.3278 cm/year at Sikrara in Sikrara block.

Table – DWL Trend during Post-monsoon period (2003 to 2012)

The general rate of decline is more in Post-monsoon period than in Pre-monsoon period for 2003 to 2012.

s/n o	Number of wells analyzed	Number of wells showing declining trend.	Number of wells showing decline of						
			0-20 cm/y	20-30 cm/y	30-40 cm/y	40-50 cm/y	50-60 cm/y	60-70 cm/y	>70 cm/y
1	36	29	11	04	03	02	0	03	06

4.2 Ground Water Resource: The dynamic ground water resources of the district as on 31.3.2009 are given in the following table:

**DYNAMIC GROUND WATER RESOURCES OF JAUNPUR DISTRICT, UTTAR
PREDESH AS ON 31.03.2009**

Sl. No.	Assessment Units - Blocks	Annual Ground Water Recharge (in ham)	Net Annual Ground Water Availability (in ham)	Existing Gross Ground Water Draft For All Uses (in ham)	Net Ground Water Availability For Future Irrigation Development (in ham)	Stage of Ground Water Development (in %)	Category of Block
1	Badlapur	7998.75	7198.88	6497.6	343.38	90.26	Critical
2	Barsathi	6385.25	5722.43	5030.79	387.54	87.91	S. Critical
3	Buxa	5591.03	5031.93	5383.48	-618.04	105.0	O.Exploited
4	Dharmapur	4084.72	3676.25	3334.42	136.41	90.7	Critical
5	Dhobi	5624.16	5342.95	4740.10	347.44	88.72	S.Critical
6	Jalalpur	5550.85	4995.77	3274.69	1487.13	65.55	SAFE
7	Karanjikalan	5476.9	4929.21	5794.33	-1469.97	117.55	O.Exploited
8	Kirakat	5043.28	4791.12	5207.76	-632.56	108.7	O.Exploited
9	Khutan	7552.50	6797.25	6007.42	416.45	88.30	S.Critical
10	M.Badshapur	10562.35	9506.12	3565.27	5555.98	37.5	SAFE
11	Machlisahar	10982.21	9883.99	5015.91	4572.97	50.74	SAFE
12	Madiyahun	7798.32	7408.40	5175.17	1890.65	69.81	SAFE
13	Maharajganj	8352.69	7517.42	6911.96	263.58	91.91	Critical
14	Muftiganj	5104.66	4594.19	4065.13	343.72	70.93	S.Critical
15	Ramnagar	5821.79	5239.61	3079.4	1955.01	58.77	SAFE
16	Rampur	7333.37	6600.03	4658.86	1718.69	70.59	SAFE
17	Shahganj	11762.58	11174.45	7596.82	3150.6	67.98	SAFE
18	Sikrara	7324.65	6592.19	4957.75	1366.69	75.21	S.Critical
19	Sikroni	2717.35	2445.62	3821.76	-1656.83	156.21	O.Exploited
20	Suithakalan	10287.18	9772.82	6147.02	3244.90	62.9	SAFE
21	Sujanganj	9746.03	8771.43	7085.11	1381.37	80.77	S.Critical
	TOTAL	151073.62	137992.06	107250.75	24189.11	77.72	

The net annual ground water availability in the district ranges from 2717.35 Ham to 11762.58 Ham, minimum being in Sikroni block and maximum being at Muhrabadshapur block, Gross Ground Water Draft ranges from 3079.4 to 7596.82 Ham minimum in Ramnagar block and maximum in Shahganj block. Net Ground Water Availability for future irrigation development is minimum in Sikroni block (-1656.83 Ham) and maximum in M.Badshapur block (5555.98 Ham). Stage of Ground water development in the district is minimum in M.Badshapur block

(37.5%) and maximum in Sikroni block (156.21%). Stage of ground water development of the district as a whole is 77.72%.

Of all the blocks in the district only eight are safe, six falls in semi-critical category, three fall in Critical category and Buxa, Karanjiakalan, Kirakat and Sikroni blocks fall in Over Exploited category. (Since stage of ground water development is high and there is significant decline of post-monsoon water level i.e, more than 20 cm/year for the period 2003 to 2012.)

4.3 Ground Water Quality: Ground water in shallow aquifer, in general, is colourless, odorless and slightly alkaline in nature. The specific conductance ranges from 425 to 850 $\mu\text{S}/\text{cm}$ at 25°C. Conductance below 750 $\mu\text{S}/\text{cm}$ at 25°C. has been observed in about 80% of analyzed water samples.

It is observed that ground water is suitable for drinking and domestic uses in respect of all parameters except Floride in Shahganj block where it is (1.8mg/l) . The Floride ranges from 0.3 to 1.8 mg/l. The total hardness in the district ranges from 195 to 285.

4.4 Status of Ground Water Development:

4.4 Status of Ground Water Development:

Development of ground water in the district is mainly through dug wells, Hand Pumps – India Mark-II and Tube wells. The gross ground water draft for irrigation in the district as on 31.3.2009 is 978.23MCM whereas the ground water draft for domestic and industrial use is 94.27 MCM. Hence the existing gross ground water draft for all uses in the district is 1072.50 MCM. Net Ground Water Availability for future irrigation development in the district is 241.89 MCM. A quantum of 159.79MCM has been allocated for domestic and industrial requirement for next 25 years (2033). Net available ground water availability in the district is 1379.92 MCM. The stage of ground water development for the **district is 77.72%. Of all the blocks in the district only eight are safe, Barsath,i, Dhobi,Khutan , Sujanganj, Sikrara and Muftiganj falls in semi- critical category, Badlapur, Maharajganj and Dharmapur fall in Critical category and Buxa, Kirakat, Karanjiakalan and Sirkoni blocks fall in Over Exploited category.**

Water Supply based on ground water sources

U.P. Jal Nigam is the government agency responsible for providing drinking water supplies to the urban and rural population in the district. The water requirements of the habitants are met with through surface water sources or through various mini water supply schemes or integrated water supply schemes utilizing the available ground water resources.

There are many shallow and deep tube wells through which water is supplied through pipe lines/taps in the urban areas of the district.

In the rural areas of the district there are 3386 no. of villages in which water is supplied by Tap/Hand Pump India Mark II, benefiting 23,01,094 population as per data of 2010-11.

5. Ground Water Management Strategy:

5.1 Ground Water Development

In Shahganj and Ramnagar, Muqrabadshapur and Machlisahar blocks, the level of development is <60%. In these blocks there is scope of ground water development with proper management and control.

In the blocks of high level of ground water development (>70%) covering major parts of the district, almost 17 blocks it is necessary to exercise caution while planning further development of available ground water resources in the district.

In the areas of low ground water development the wells suitable for extraction of ground water, suitability of rigs, depth range and discharge in the district can be summarized as follows:-

Sl.No,	Wells feasible	Rig suitable	Depth of well (m)	Discharge (lpm)
1.	Dug well/Hand	Manual/ Hand	20-40	50-100

	Pump	Boring set		
2.	Shallow Tube well	Rotary Rigs (Direct/Reverse)	50-120	1500-2000
3.	Deep Tube well	Rotary Rig	150-280	2000-4000

5.2 Water Conservation & Artificial Recharge

In the areas where premonsoon depth to water level is more than 8mbgl and post-monsoon depth to water level is more than 5 mbgl and rate of decline during post-monsoon period is 25 cm/year, there is immediate need to adopt techniques of water conservation and artificial recharge.

In such urban area, roof top rain water harvesting should be made mandatory for all government buildings, schools etc. Recharge Pits/shafts/trenches of suitable design are ideal structures for rain water harvesting in such areas. Central Ground Water Board provides free technical guidance for implementation of roof top rain water harvesting schemes.

In rural areas check dams, Cement Plug should be constructed as per local hydro geological conditions to recharge the area. Revival, Renovation and Restoration of Ponds should be encouraged to arrest the decline of water level.

6. Ground Water Related Issues and Problems:

The trend analysis of historical ground water level data indicate fall both in Pre and Post-monsoon period in the major parts of the district. This will impact in:-

- (i) further decline of ground water level
- (ii) drying up of dug wells/shallow wells
- (iii) decrease in yield of Tube wells, and
- (iv) Increased expenditure and power consumption for drawing water from progressively deeper depths.

7. Awareness & Training Activity:

Central Ground Water Board has not conducted any Mass Awareness Programme and Water Management Training programme in the district. In Buxa, Karanjiakalan, Kirakat and Sikrona blocks which falls in Over Exploited category both these programmes should be done in the future.

8. Areas Notified by Central Ground Water Authority:

Central Ground Water Authority has not notified any area/block in the district.

9. Recommendations:

1. As level of development in many blocks of the district is high, further development of ground water should be arrested in these areas, especially in Buxa, Karanjia kalan, Kirakat and Sirkoni block which falls in Over Exploited category.
2. Artificial recharge technique should be adopted in the district due to occurrence of deep water condition to arrest the decline of water level. In urban areas, roof top rain water harvesting, with structures such as Recharge pits/shafts/trenches of suitable design, should be made mandatory for all government buildings, schools etc. having large roof top area.
3. All blocks exhibiting declining trends in their ground water level should be regularly monitored of water levels at close intervals through suitably located structures is essential.
4. To minimize the over stress on Phreatic Aquifer, it is advisable to plan heavy duty water supply tube well for future all uses by exploiting the Ground water from the deeper aquifer.
5. Efforts should be made to reclaim the barren land resulted due to saline efflorescence for agriculture purpose. The area of shallow ravines is reclaimable for cropping.
6. Excessive use of fertilizers by the farmers should be discouraged particularly in blocks showing high nitrate concentration in the past.

References:

1. Statistical Data available in the website: www.upgov.nic.in.
2. Report on Hydro geological frame work and Ground Water Resources Potential, Jaunpur District, U.P., Jan' 2005-2006.



