

LUCKNOW DISTRICT



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Basic Information

Geographical Area :	2528 Sq. Km.	No. of Blocks:	08
Basin :	Ganga	Population:	36,81,416
Availability of Ground Water :	86765.45 ham.	Stage of G.W. development:	50.10%

Introduction

Lucknow district is a part of Central Ganga Plain of the state covering an area of 2528 sq.km. and lies between North latitudes 26°30' and 27°10' and East longitudes 80°30' and 81°13' with total population of 36,81,416 as per 2001 census (density:1456 persons/sq.km.). The district is bounded in the north by Sultapur district; in the east by Barabanki district; in the south-east by Rae Bareili Distt; and in the north-west and south-west by Hardoi and Unnao district respectively. The entire district falling in Gomti Sub-basin of Ganga basin represents flat topography except occurrence of lakes



Top

i.e. natural depressions containing water in the north-east in Bakshi-Ka-Talab block, in Mal block and in South-east in Mohanlal Ganj and partly in Gosainganj block. The irrigation in the district takes place through Sharda Canal and Sharda Sahayak network systems and tubewells. About 92% of the district area is under cultivation. About 85.92% area of net sown area (142247 hectares) is irrigated both by surface water (Sharda Canal and Sharda Sahayak network systems) and ground water through shallow and moderately deep tubewells. The share of surface water irrigation is 26% while that of ground water is 74%. The economy of the district mainly depends upon Agriculture

The district receives a normal rainfall of 1019 mm with 47 rainy days experiences sub-tropical climate. The district is mainly drained by river Gomti and its tributary Sai which are perennial in nature.



Hydrogeology

The area is underlain by Quaternary alluvium consisting of clays, occasional kankar, and sand of various grades in different proportions. The sandy horizons at different depths form the main aquifer of ground water in the area. The area can be broadly divided into two geologic units namely younger and older alluvial plains. The younger alluvial plain lies all along the river Gomti and forms a wide flood plain. The older alluvial plain occupies higher level than younger alluvial plain along with uplands and as natural



levies, paleo channels and meander scars. The results of 32 exploratory bore holes drilled by CGWB ranging in depth 100 mbgl to 753 mbgl reveal that the following four aquifer groups exist in the district.

I Aquifer Group	00-150 mbgl
II Aquifer Group	160-210 mbgl
III Aquifer Group	250-360 mbgl
IV Aquifer Group	380-600 mbgl

The ground water occurs under unconfined to confined conditions. The pre-monsoon depth to water level in general ranges from 5.20 to 32.70 m.bgl while post-monsoon depth to water level varies from 1.61 to 28.40 m.bgl. The area experiencing water logging/ prone to water logging lies mainly along the Sharda Sahayak canal network system. The areas having comparatively deeper water levels mainly lie in the central part of the district.

The yield of shallow tubewells ranges from 200 lpm to more than 500 lpm while that of exploratory tubewells varies between 330 lpm and 2270 lpm at drawdowns ranging from 3.51 to 32.77. Based on yield of exploratory wells the district can be divided into two parts. The first part lying in north-east and south-east of Lucknow has better yield prospects and successful tubewells yielding upto 3000 lpm can be constructed. The second part of the area having moderate yield lies in the north-west and south-western parts of the district including Urban area. Successful tubewells yielding about 1500 lpm can be constructed in the above areas since top aquifer is under maximum stress for ground water development. The yield in the Eastern part along the Sai River varies between 1000 lpm and 2000 lpm.



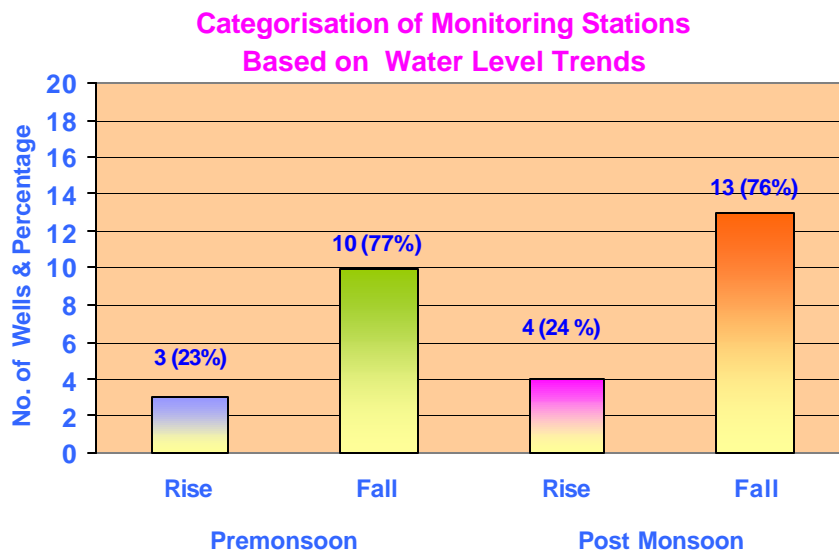
The exploratory tubewells tapping I aquifer group are capable of yielding 1100 to 1700 lpm at drawdowns ranging from 4.33 to 8.70 m.

Auto flow conditions have been recorded at Badshah Nagar Deposit well constructed down to 480 mbgl screening granular zones encountered between 144 and 477 m. Piezometric head of 2.40 magl was recorded on this tubewell.

The ground water development takes place in the study area mainly for drinking and irrigation purposes through shallow and moderately deep tubewells.

Long Term Water Level Trend

The long term Pre-monsoon water level trend (1980-2003) shows that the major part of the district experiences declining trend except the canal command area where rising trend is observed.



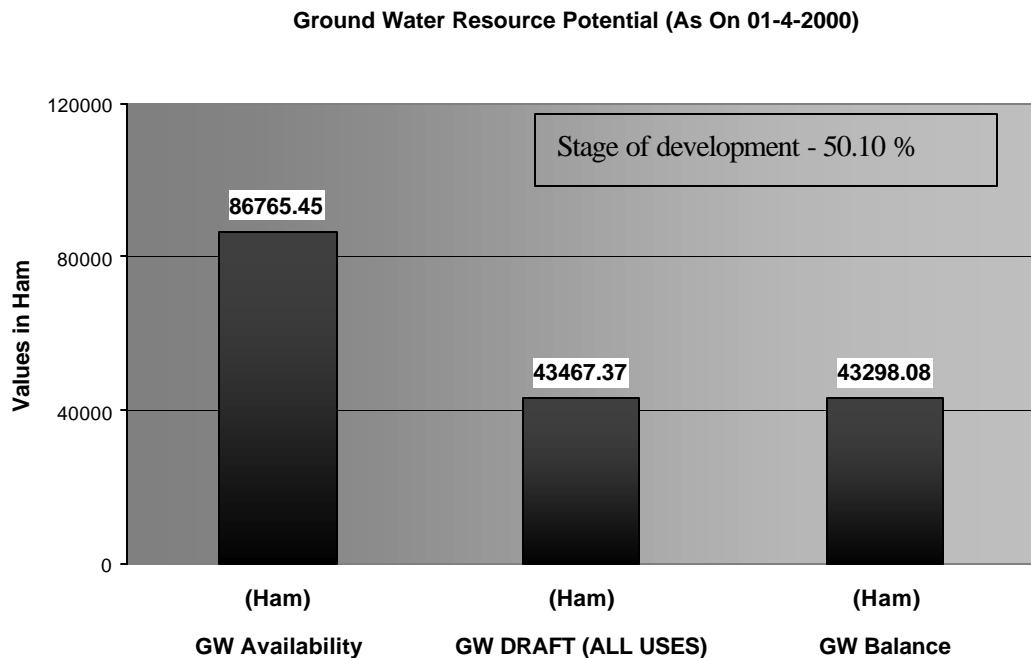
.Ground Water Quality

The ground water quality in the major parts of the district is fresh and suitable both for domestic and irrigation purposes. Ground Water pollution due to excess of chromium has been observed in Lucknow City area due to existence of tanneries.

Ground Water Resource Potential



The ground water resource potential has been estimated based on "GEC 1997 Methodology" as on 1.4.2000, which is graphically represented below.



Ground Water Management

On the basis of availability of ground water, the district can be divided into two parts. The first part lying in the North-east and South-east of Lucknow has better yield prospects and successful tubewells yielding upto 3000 plum can be constructed. The second part of the area having moderate yield potentials lies in the NW. West and South-West part of the district including the urban area. Successful tubewells can be constructed yielding of 1500 plum in these areas Since the top aquifer is having maximum stress towards development, further development in this aquifer needs greater caution in order to arrest decline in water level. The aquifer material is fine grained sand to silt in the second, third & fourth aquifers and hence suitable slot size has to be used. The draw down in these aquifer groups is quite high when tapped individually. In the phreatic aquifer within 50m depth, dug wells / hand pumps / tubewells are feasible in the entire area which can sustain yield of 200-500 lpm.

In urban and rural areas, construction of artificial recharge structures viz. roof top rain water harvesting, percolation tanks and nullah bunding techniques are feasible.

