

ALIGARH DISTRICT



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Basic Information

Geographical Area :	5498 Sq. Km.	No. of Blocks:	17
Basin/Sub-basin:	Ganga/Yamuna	Population:	43,23,760
Availability of Ground Water :	104588.60	Stage of G.W. development:	76.66%

Introduction

Aligarh district is a part of Central Ganga Plain of the state covering an area of 5498 sq.km. and lies between North latitudes 27°28' and 28°10' and East longitudes 77°29' and 78°36' with total population of 4,32,37,60 as per 2001 census (density:786 persons/sq.km.). The district is bounded by river Ganga in the west and the river Yamuna in the east. The entire district falling in Upper- Ganga doab represents flat topography. The irrigation in the district takes place through Upper-Ganga and Lower Ganga Canal network system and tubewells. About 85% of the district area is under active cultivation. About 79% area of net sown area (398600) is irrigated both by surface water (Upper Ganga & lower Ganga Canal network system) and ground water through shallow and moderately deep tubewells. The share

of surface water irrigation is 15% while that of ground water is 85%. The economy of the district mainly depends upon Agriculture

The district receives a normal rainfall of 708 mm with 46 rainy days experiences sub-tropical climate. The district is mainly drained by river Ganga & Yamuna and their tributaries. Karwan, Sirsa & Sengar are important tributaries of Yamuna whereas Rind, Isan Neem & Kali nadi forms the principal tributaries of Ganga. The Yamuna & Ganga sub-basins are separated by a NNE-SSW water divide.

Top



Hydrogeology

The district is underlain by thick pile of quaternary sediments which comprises sands of various grades, clays & Kankar. The Quaternary sediments overlain the pre existing Vindhyan Basement with the thickness varies from 286 to 380 metres. The Vindhyan basin tends to deeper from west to east. By & large three tier aquifer system has been demarcated in the district occurring down to bed rock.

I Aquifer Group	00.00 - 130.00 mbgl – Quality fresh.
II Aquifer Group	100.00 - 150.00 mbgl – Quality Brackish to saline.
III Aquifer Group	130.00 – 300.00 mbgl – Quality Brackish to Saline.

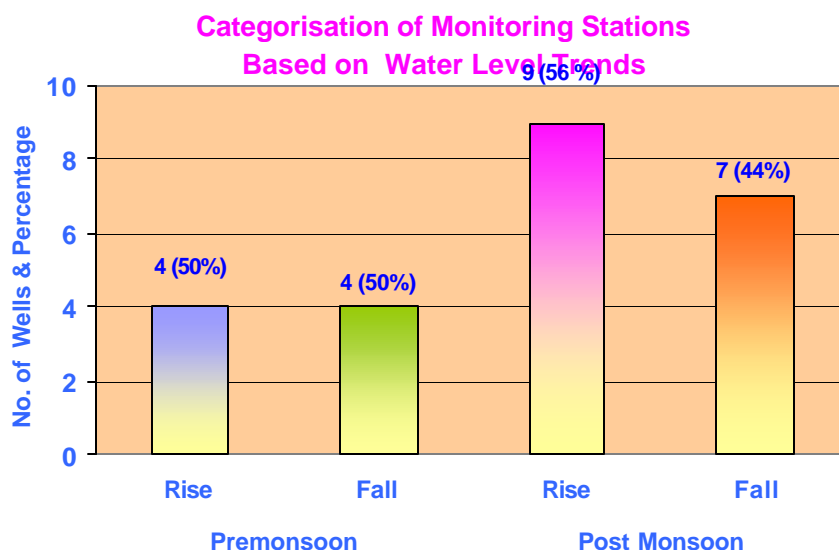
Ground water occurs under Water table conditions in the upper zones of first aquifer group while in deeper aquifers it is under semi confined to confined conditions. Depth to water level in the area generally varies from 2.57 to 21.00 m.bgl during premonsoon period & during post monsoon period it ranges between 0.13 m & 16.73 m.bgl. Water level rests generally at shallow depth along the main canals and their tributaries. The range of water level

fluctuation between pre and post monsoon period is between 0.32 and 7.24 metres. In general a seasonal fluctuation of 2 meters can be seen over the entire district.

Tubewells are feasible in the first aquifer group only. The quality of this aquifer group is good to moderate & fit for domestic and industrial purposes. Successful tubewells can be constructed in this aquifer group which are likely to yield 2000-3000 lpm of discharge in the eastern part of district between Kali & Ganga. The discharge of 1000-2000 lpm can be obtained between Kali & Yamuna river by constructing shallow tubewells down to 1300 m depth.

Long Term Water Level Trend

The water level data recorded from National Hydrograph Stations during the period 1980-2003 has been analysed both for Pre-monsoon and Post-monsoon. The number of NHS with their percentage in respect of Rise & Fall has been graphically shown below:



The major part of the district experiences declining trend except the canal command area where rising trend is observed.

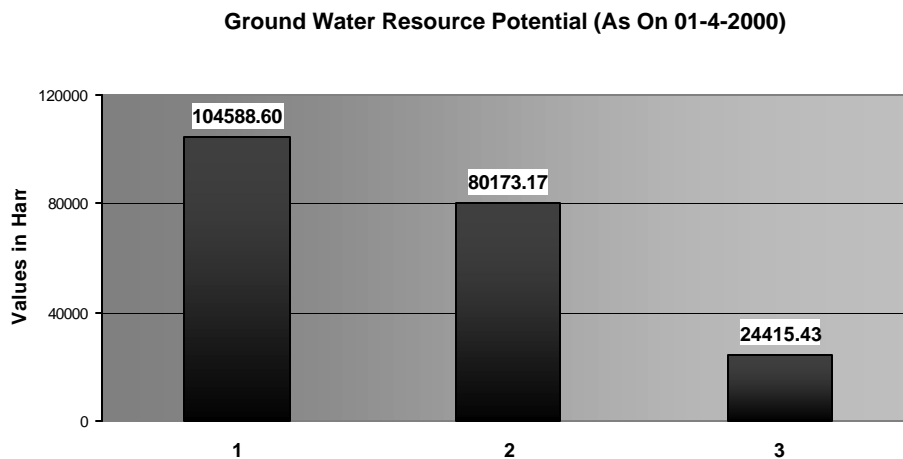
Ground Water Quality

The quality of ground water below phreatic i.e. first aquifer group occurring down to 130 metres depth is good to moderate and fit for domestic and industrial uses. The ground water is alkaline in reaction, bicarbonate type & mildly mineralized. The formation water of second and third aquifer as revealed by Electrical logging of boreholes, is brackish to saline and is not fit for domestic and irrigation purposes. Chemically the surface water is mildly alkaline with a low degree of mineralisation and suitable for domestic and agriculture purposes.

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.



Stage of G.W. development:

76.66%

Ground Water Management

An unplanned irrigational and domestic use of ground water have seriously affected the hydrological regime in many blocks of the district. The continuous decline of water table at places must be given a serious thought. Proper management of available water resources has to be planned at block level. To meet the domestic and irrigational need the first aquifer down to depth of 130 metres which is under expressive stress should be exploited with caution as the quality below this aquifer is saline. This deeper aquifer should be explored in the Atrauli & Sikandara Rao tehsils where the alluvium thickness is maximum and after confirming the water quality if found good, large scale development may be undertaken by constructing deep tubewells. Further exploitation in blocks of tappel, Iglas, Hathras, Sikandara Rao, Chandaus , Khair , Lodha, Dhampur, Sasani & Atrauli from the phreatic aquifer should be restricted as the water level rests between 10 to 15 mbgl. Surface water irrigation system should be planned and effectively be executed in these blocks by increasing the additional network of canals, which will help in recharge of ground water.

In the overexploited blocks Lodha and critical block Chandaus, the ground water exploitation should be stopped immediately and artificial recharge to ground water system should be implemented through roof top rain water harvesting, injection wells, recharge pits & shafts & dug well recharge. As the ground water development in the district is 76.66% the judicious management of water resources be made by the conjunctive use of surface water & ground water.

