



PROCEEDINGS:

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**ACTIVITIES AND ACHIEVEMENTS OF GROUND WATER DEPARTMENT,
ANDHRA PRADESH**

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Andhra Pradesh with a total geographical area of 2,744 lakh sq.kms is the fifth largest State with a population of 60.50 million (1991 census). About 73 percent of the population depends mainly on agriculture. Out of the total geographical area of 2744 lakh sq.kms, about 53 percent is cultivable land. The Committee on the examination of ground water resource and irrigation potential has estimated that the ultimate irrigation potential of the state by utilizing ground water is 4.40 million hectares, of which only 1.92 million hectares is realized so far.

Functions of the department are:

- Hydrogeological and Geographical surveys for delineation of potential zones.
- Detailed integrated surveys to locate feasible well sites and for scientific construction of the wells under different exploitation programs of the government and private sectors.
- Exploratory drilling cum production well construction program
- Monitoring of water levels
- Investigation for artificial recharge structures.
- Estimation of ground water potential
- Conjunctive use studies
- External aided projects
- Application of latest techniques of aerial photo interpretation and remote sensing.

Hydrogeological and geophysical surveys for delineation of potential zones

Under the program of intensification of exploitation activity, detailed surveys were conducted by the department in an area of 1.78 lakh sq.kms covering different geological formations and delineated 45,000 sq.kms of potential zones as feasible for ground water development

Detailed integrated surveys to locate feasible well sites for scientific construction of the wells under different exploitation programs of the government and private agencies:

The department is closely associated with the selection of feasible sites for different types wells viz., dig wells, borewells, filter points and dug-cum-borewells to various Government Agencies. Corporate and private individuals involved in ground water development. Since inception of the department, a total number of 5.88 lakh sites were examined and 3.20 lakh sites were selected for construction of different types wells up to March, 1998. Out of 5.88 lakh sites 2.39 lakh sites for Scheduled Castes beneficiaries



(5%). During 1998-99 up to November 1998 the department has investigated 17,237 sites and selected 11,102 sites for construction of different ground water structures.

Explanatory drilling cum production well construction program

Under exploratory-cum-production well drilling program the department constructed 9,975 bore/tubewells in different geological formations up to March, 1998. The wells constructed under the program, on completion will be handed over to User Agencies for energisation and utilization for different purposes. Out of 8,495 bore/tube wells, 2,738 bore/tube wells are for Scheduled Castes (35%) and 602 bore/tube wells for Scheduled Tribe beneficiaries (7.56%). During 1998-99 up to the end of November, drilled 120 borewells/tubewells including Hydrology Project work

Monitoring of water levels

The department has established 1,766 observation wells in Non-Command Area and 1,510 observation wells in command area of the States to monitor the water levels and water quality at regular intervals. The water levels in the premonsoon and postmonsoon period are collected along with water samples from the observation wells and hydrographs are drawn to study the water level fluctuations vis-à-vis rainfall, ground water quality, and intensity of groundwater exploitation.

Monitoring of water level fluctuations indicated the gradual water level depletion in the State in general and drought prone districts in particular. In general, the depth to water levels ranges from less than 1.00 to 24.00 m in Telangana region. Deeper water levels are observed especially during summer months in parts of Mahabubnagar, Nalgonda, Hyderabad and Medak districts. In Rayalaseema, the depth to water levels varies from less than a metre to more than 18.0 m in parts of Anantapur, Chittoor, Kurnool and Cuddapah districts and record deeper levels of more than 15.0 m in summer and in drought years in majority of the cases. In coastal Andhra, the depth to water table varies from less than a meter along the coast to more than 13.0 mts in upland areas of Guntur, West Godavari and Visakhapatnam districts. Continuous net declining trends are witnessed in water levels in a serious drought years or closely spaced drought years in some parts of the State especially in the drought prone districts.

Investigations for artificial recharge structures

Rural areas:

The declining of water levels in the drought prone districts has become focus of attention for the Department. The Department has investigated in detail for the feasibility of taking up artificial recharging structures for increasing ground water resources in these areas. So far 3,496 sites were examined and 8,731 feasible sites were recommended for construction of check dams and percolation tanks. During 1998-99 up to the end of November, 1998 investigated 387 percolation tanks/check dam sites and recommended 266 sites.



Rain water harvesting from roof top in urban areas:

Urbanization and fast industrial growth caused a great trust on groundwater use in urban areas. The covering of open areas by black top roads and pavements along with footpaths further internal domestic paving with cement further damaged groundwater table in the urban areas of the State. The need for the artificial recharge through rainwater harvesting from roof top and road to in Municipal areas was realized as urgent measure by the department. Five workshops at Visakhapatnam, Vijayawada, Warangal, Anantapur and Hyderabad were conducted with the participation of Commissioner of Municipal Administration & Urban Development. A total number of 760 pits and trenches are cleared technically for artificial recharge through rainwater harvesting from roof and road top in the urban areas.

Estimation of ground water potential:

The Department using all infrastructures periodically estimates the groundwater potential according to the guidelines of Groundwater potential according to the guidelines of Groundwater Estimation committee along with the Members of State level Committee. The categorization as Dark / Grey is done according to the level of development vis-à-vis resources estimated. The groundwater potential assessment made as on March,1993 identified 15 full Mandals, 51 Mandals as partly Dark Mandals covering 580 villages as Dark. As per the guidelines micro level surveys based pm water shed wise were completed in 15 full Mandals and reports were submitted to National Bank for Agriculture and Rural Development for considering refinance for Minor Irrigation Programmes by suggesting 14,725 additional wells with pumpset to take up. Out of total 1116 Mandals in the State 1001 are White, 49 are Grey, 51 partly Dark and 15 Dark Mandals in groundwater potential.

Conjunctive use studies:

Command areas present special problems as irrigation are increased resulting in changes in the groundwater regime, which needs to be monitored, evaluated and corrected. Conjunctive use studies in four major Project canal command areas of 1) Sriramsagar Project 2) Nagarjunasagar Left Canal 3) Nagarjunasagar Right Canal and 4) Thungabhadra Project Complex in Andhra Pradesh are being taken up by Ground Water Department.

External aided projects:

The Department is also taking up the Projects/Schemes with external financial assistance. They are (1) National Hydrology Project (2) JICA Project (3) Advance Research in Fractured Hydrogeology with the Collaboration of France and (4) A.P.Well Project assisted by Netherlands Government.

I (a) National hydrology project:

The proposed National Hydrology Project is envisaged as an Action Plan for groundwater development and management to be implemented at an estimated cost of Rs. 14.81 crores from 1995-2001. The Project



aims to improve and integrate the State and Central organizations network of purpose build observation wells in different geological environs to monitor piezometric heads and change in different aquifers and the quality relationship, providing computerised data storage by providing computers to all the offices in the State. Upgrading the processing facilitates for the uniform quality and water level capabilities of chemical labs to analyze water samples up to 70 parameters.

(b) R & D project under hydrology project:

Fresh water saline water inter-relationship in the multi aquifer systems of the rishna delta, coastal Andhra Pradesh.

A pilot project study for fresh water-saline water inter-relationship., its movement on the basis of scientific hydrologic information and tools in Krishna delta is proposed. An area of about 300 Km² is considered for intensive studies under this project.

1. To characterize the various components of the multi aquifer system and to establish their quantitative inter-relationships.
2. To stimulate the system through numeric modeling and to develop a management tool for planning programme and device possible salvage strategies.

Total cost of the project is Rs. 105.26 lakhs and Deltaic Regional Centre of National Institute of Hydrology is Rs. 20.32 lakhs.

Applications of latest techniques of aerial photo interpretation and remote sensing:

So far 24,000 sq.kms. area was covered and 41,500 lineaments ranging in length between 1 and 6 km. have been identified. The Department has taken action in procurement of Geocoded false colour composite from National Remote Sensing Agency on 1:50000 scale.