

**SITUATION ANALYSIS FOR STATE STRATEGY FOR
WATER AND ENVIRONMENTAL SANITATION**

ANDHRA PRADESH

FINAL REPORT

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SUMMARY AND RECOMMENDATIONS

Background

Andhra Pradesh is the fifth largest state with an area of about 275,000 sq km, and is the fourth most populous state in the country (after Uttar Pradesh, Bihar and West Bengal). The state had a population of 66.5 million in 1991, 73 percent of whom live in rural areas.

Andhra Pradesh can be divided into three regions - Coastal Andhra, Rayalaseema and Telengana on the basis of history and socio-cultural moorings. The tribal dominated hilly areas which spread across the Telengana and Coastal Andhra regions can be considered a fourth zone as they are particularly under developed and have a unique set of problems.

Economy and Employment

Agriculture continues to be an important contributor to the state economy and the changing structure of the state economy is reflected by the fact that between 1960-61 and 1995-96, the share of agriculture declined from 59 percent to 38 percent while the tertiary sector increased its share from 29 percent to 43 percent. However, the shifts in the sectoral share of income generation has not been followed by a similar shift in the work force, thus implying that rate of growth of incomes in agriculture was lesser than other sectors.

Only a third of the investments projected for the manufacturing sector materialised during the eighth plan period, partly attributed to the power situation in the state. The distribution of factory employment across districts is concentrated in the districts of Hyderabad, Rangareddi, Medak, (in the catchment of Hyderabad city) and in the coastal districts of Guntur, Vishakhapatnam and East Godavari. The Vision 2020 statement of the GoAP which has identified 19 thrust areas for development; the New Industrial Policy (1995) which aims at an ambitious 20 percent annual rate of growth, would entail substantial private investment, which would hinge on the support infrastructure being in place.

Access to Drinking Water

In 1991, tanks provided drinking water to only four percent of households, while rivers and springs were used by three percent of households (Census of India, 1991). Piped water supply was available to only 14 percent of the rural households. This reflects the very high reliance on ground water for household purposes in the state. In urban areas of Andhra Pradesh, piped water supply was available to 73 percent of the households (1991), while 24 percent get their drinking water from wells and tubewells or handpumps.

The proportion of rural households relying on community (or common access) services for drinking water is high (88 percent in 1991, 89 percent in 1993), reflecting the comparatively iniquitous access to water sources. About 56 percent of urban houses (1991) have to rely on community sources for drinking water indicating the continuing burden and time spent in collecting drinking water for the households. Quality problems (Fluoride, brackishness) affect nearly a third of the habitations and amelioration of these is slow, as more than half of the habitations are not fully covered by safe drinking water provisions.

Access to Sanitation

About 15 percent of households in the state have provision of latrines, which is comparable to the national average (NCAER, 1999). However, the percentage of latrines with flush water facilities is lower in rural Andhra Pradesh (three percent) as compared to the All India average (9 percent), which reflects the poor availability of water within premises for this purpose, in most part of the State. The state government initiative under the Janmabhoomi has added over a million latrines till date. Demand responsive approaches like Rural Sanitary Marts have been initiated in a few districts. Studies in select districts (TARU, 2000) show that the success of the initiative is very much dependent on linkage with the government programmes and there has not been much success in initiating the demand for sanitation.

Access to Electricity

About 63 percent of all households in the state report access to electricity which is higher than the national average of 43 percent and is among the highest in the four southern states. Only states of Haryana, Punjab, Himachal Pradesh and Gujarat report a higher rate of domestic electrification. The areas of concern however are that a little over half (53 percent) of the low income households have access to electricity while among the SCs and STs, the proportion of households with electricity is lower at 47 percent (NCAER, 1999).

Households in Andhra Pradesh have better access to household amenities than in other parts of the country. However, differentials across socio-economic groups are high which are only likely to be heightened with any measures that aim to remove subsidies.

Health Conditions

The states compares unfavourably with the other southern states in terms of sex ratio, IMR and CMR. However, there has been a rapid decline in TFR for Andhra Pradesh during the 1980s and 1990s, comparable to decline rates achieved by the states of Kerala and Tamil Nadu, who have managed to reach near replacement levels of population growth. Communicable diseases constitute about 54 percent of the total burden of disease, non-communicable diseases about 34 percent and injuries about 16 percent. The short-term morbidity prevalence rate is 132 per thousand population (NCAER, 1999), which is higher than the national average of 122.

Vulnerable and Disadvantaged Groups

The tribal population (6 percent of total population) in the state resides mostly in the Tribal sub-plan areas. The literacy rate for the Scheduled Tribe communities in Andhra Pradesh is about 14 percent, which is the least amongst the southern states. The IMR in tribal areas in Andhra Pradesh is in the 120-212 per 1000 live births range, compared to 73 in the non-tribal districts. A key problem faced by tribals are degrading forest environments leading to loss of livelihoods and inadequate basic services, which arise also in part due to inaccessibility of terrain.

Water Resources

The major part of the state lies in the plateau zone lying about 600 m amsl toward the west. The Eastern Ghats form a series of disjointed hill ranges parallel to the coast along the western border of the coastal plains. These ranges have some of the best forests in the state and are inhabited mostly by tribes.

TABLE (1): PHYSIOGRAPHIC REGIONS IN ANDHRA PRADESH

Physiographic Regions	No. of Villages	No. of Towns	Percent to Total Area	Rural Population Density* (per sq km)	Percent of Rural Population	Percent of urban Population
Coastal Plains	3,684	54	9%	382	18%	21%
Plains (Interior)	11,508	114	40%	201	45%	42%
Uplands	4,397	43	15%	184	16%	29%
Plateaus	1,559	13	7%	158	6%	3%
Riverine tracts	2,523	2	3%	150	3%	1%
Forests	4,615	16	15%	88	8%	3%
Hills	1,414	10	10%	57	3%	1%

Source: Regional Divisions of India – A Cartographic Analysis, Andhra Pradesh, Gol

* Projected from 1981 data

Highest population densities are reported from the agriculturally well-developed coastal plains. This has nine percent of the area but houses 18 percent of the rural and 21 percent of the urban population. Water shortage is not a major issue but these areas have problems of saline aquifers which necessitates long distance conveyance of water to some of the coastal communities. This region is one of the most irrigated regions of the state.

The plains and uplands of the state lie in the hard rock region. The southern part of the state lies in semi-arid zone and rainfall variability is quite high in most parts of these plains and upland regions. The population densities of plains and upland regions are more than the state average. Some parts of these land types have high fluoride bearing groundwater. There are pockets of groundwater over-exploitation in these regions. Regular summer water shortages and occasional droughts are quite common in these regions.

The lowest population densities are reported from forest tracts and hilly regions located mostly in the Northeastern part of the state. The tribal settlements are generally dispersed and often hamleted. Most of these regions are less accessible due to terrain conditions. Groundwater availability is restricted to very few aquifers, while numerous streams in these regions have water during most part of the year and are a common sources of domestic water.

Geology

The geology of the state is dominated by rocks ranging from the Archean to the Gondwana period. The coastal region with recent alluvium forms the youngest rocks. Most parts of the state lie in Archean and Pre-Cambrian terrain. The central and western part of the state is covered by Archean rocks. These rocks have developed secondary porosity due to repeated

In 1991, Andhra Pradesh had a SC population of 10.59 million (15.93 percent of the total population of the State). Literacy level among SCs (25.89 percent) is below the national average, and many SC households live below the poverty line. Consequently, most state initiatives for the welfare of SC are education and economic support programmes. Many SC localities in the state are observed to be characterized by congestion, insanitary conditions, and lack of basic amenities including safe drinking water. It has been observed that early childhood deaths among SCs, especially in rural areas, take place due to malnutrition.

Employment

The work force participation rate in the state is high at 45 percent, among the highest in the country (All India: 38 percent) but the per capita income is lower than the national average (AP: Rs 8,938, All India: Rs. 10,771, in 1996-97 (Quick Estimates), at current prices) across all years over the last decade. The rural female work force participation rate in the state is high (36 percent in 1991) and is increasing, but literacy levels among rural women are poor and the male-female literacy differential is as high as 27 percentage points in the Rayalaseema region of the state. The wage rate for women on an average is 30 to 40 percent lower than for men, across the state. These factors indicate that while the burden of work on women is increasing, they are largely in the low paid sectors, their capacity to take up more value added work with a lower component of drudgery, is not being enhanced.

Poverty

According to recent estimates, the population below the poverty line in AP has declined significantly and is currently reported to be about 21 percent (39 percent for All India)¹. An analysis of poverty trends in rural Andhra Pradesh using time series NSS data over the 1957-94 period indicates that the average Head Count of Poverty (H) which measures the proportion of population below the poverty line, or the extent of poverty remained as high as 64 percent during the entire 1957-1973 period which more or less reflected the national trend although the value in Andhra Pradesh was higher than the all-India average. The steep reduction in H during the last two decades, seems to reflect the greater effectiveness of poverty eradication strategies in the state.

The decline in proportion of cultivators, increased labour force in agriculture, falling area under food crops and increased risk with cash crops indicates that agriculture which is the mainstay of the rural economy, is becoming more risk prone and coping abilities of the large agricultural population are a matter of concern.

In the urban areas, the head count of poverty was low to begin with and has reduced at a slower rate than in rural areas. In 1957, it was 48.5 percent reducing by 1994 to 31 (NSS 50th round). The lowest point was reached in 1990-91 (NSS 46th round) when the head count of urban poverty touched an all time low of 28 percent. Analysis of NSS data over time, indicates that while the overall level of consumption in urban areas is higher and the poverty levels lower, the distribution effects are more skewed than in the rural areas.

¹ The rural poverty line is defined by the Planning Commission as the per capita monthly expenditure of Rs. 49 and the urban as Rs. 57 (rounded off to the nearest rupee) at October 1973-June 1974 all-India prices. They correspond to the norm of per capita intake of 2400 calories per day in rural and 2100 in urban areas.

of the population is located in the uplands, plateaus, hills and forested regions, where surface water options are few and groundwater assumes criticality.

Out of the total 1,104 Mandals in the state, six mandals were classified as "over-exploited" (more than 100 percent of utilisation of renewable groundwater resources) and 24 mandals were categorised as "dark" (85 to 100 percent utilisation). Except for one mandal, all of them are situated in the hard rock regions. The worst impacted regions are located in northern Telangana and Southern Rayalaseema. It is to be noted that in many mandals, which are "grey" or even "white", pockets of over exploitation may be present. The recent (Kharif, 1999 and Summer, 2000) droughts and drinking water shortages across the hard rock regions of the state indicate need for village/ micro-watershed level holistic assessment considering both surface and ground water resources and extent of development and usage patterns

Surface Water Resources

Krishna and Godavari are the two major rivers flowing through the state. Pennar, Vamsadhara and Nagavalli are the three smaller rivers of a total of 34 rivers flowing through the state. All these rivers carry an estimated total of 18 mham of water to the Bay of Bengal. Being a riparian state, Andhra Pradesh has the share of water from the Krishna and Godavari systems. A significant proportion of the waters from the Krishna has already been tapped while the full potential of the Godavari are yet to be tapped. The utilisable water resources of the state are estimated to be about 7.74 mham, at 75 percent availability. In 1991, Andhra Pradesh had a live storage capacity of 2.472 mham, 0.2433 mham projects were under construction and another 0.1984 mham storage capacity projects were under consideration.

The GIA from all surface sources was 3.1 mha in 1980-81 which declined to 2.85 mha in 1997-98. Decrease in area irrigated by surface sources is a matter of concern as this indicates that the surface irrigation systems are decaying due to poor maintenance or facing management problems. This can cause a decrease in ground water recharge on one side and increase in groundwater usage in the canal command areas, especially at the edge of the command areas. Andhra Pradesh has enacted Farmers' Management of Irrigation Systems Act and Rules in the 1997 and has transferred some of the maintenance functions to the Water User Associations. It is expected that these will improve the performance of canal irrigation significantly but results from the ground are awaited.

Tanks were an important source of irrigation, especially in the interior semi arid parts of the state. Tanks provided irrigation to areas not amenable to irrigation by large irrigation projects. The net area irrigated by tanks increased from 0.763 mha in 1950-51 to 1.23 mha in early 1960s. There has been a continuous decline since, in the area irrigated by tanks. This decline may partly be attributed to coverage of tank irrigated areas under the command areas of project canals, but the continued decline since the early 1980s (by which time, most canal projects were over), is a matter of concern. The net irrigated area from tanks decreased from 0.9 mha to 0.56 mha during the 1980-1997 period. There has also been no significant change in irrigation intensity of tanks.

Lift irrigation systems have been installed in parts of the state, which rely on seasonal streams and their quality depends considerably on the rainfall pattern and local factors like catchment area and upstream withdrawal. The irrigation from LI sources account for less than four

structural disturbances and often form good aquifers especially in the vicinity of faults.

The Cuddapah formations form an arcuate belt, nearly parallel to the coast with the southern end in Chittoor district and the northern end at the tri-junction of Guntur, Khammam and Nalgonda districts. They form good aquifers at places.

The Gondwana sedimentary rocks are exposed along the Godavari valley bordering Madhya Pradesh on the northeastern part of the state - in the eastern edges of Adilabad, Karimnagar, Warangal and Khammam districts. They comprise sandstones, shales and coal. Some of the sandstones are good aquifers. Deccan Traps, belonging to Cretaceous to Tertiary age, are found along the northwestern border of the state with Maharashtra and these have a few good aquifers.

The coastal sands and alluvium form a linear belt along the eastern coast and their width is maximum along the Krishna and Godavari delta region. The thickness of alluvium often attains the thickness of few hundred meters but the deeper aquifers in the area, are reported to contain highly saline water.

Rainfall

The average rainfall over the state is about 1,000 mm but this is unevenly distributed across space and time. The northern hilly and coastal areas receive more than 1,000 mm while the southwestern Rayalaseema receives less than 700 mm of precipitation. Rainfall increases towards the North and the Northeastern parts of the state. Coefficient of variability of rainfall is fairly high especially in the Rayalaseema region.

The southwest monsoon contributes nearly 80 percent of the annual rainfall in Telangana, 75 percent in Rayalaseema and 50 percent in Coastal Andhra Pradesh. Cyclonic disturbances in the Bay of Bengal, especially during winter, cause heavy rains in the coastal regions. Most of the plateau experiences hot dry climate while the coastal region is hot-humid to sub-humid. Droughts and crop failures are quite common in the interior parts of the state owing to the regional and temporal rainfall pattern.

Ground Water Resources

About 84 percent of the state is underlain by crystalline and consolidated formations. The rest of the area is either has alluvial formation or coastal sandy zones. The aquifers in hard rocks are restricted to secondary porosity caused by folding and faulting. The hard rock aquifers are sparse and disseminated. Since most part of the hard rock regions, especially the Rayalaseema districts, are located in semi-arid areas, groundwater availability is likely to be low and competing demands from agriculture can put a severe strain on drinking water availability during summers. Most of the groundwater extraction for agriculture is carried out during the rainy and winter months and wells can go dry before the onset of summer season.

There has been a significant growth in groundwater irrigation with the share of groundwater in irrigation rising from 26 percent to 51 percent during 1981 to 1998. Since more than 80 percent of the population is situated in the hard rock regions, groundwater availability becomes a critical issue to ensure drinking water availability in this state. Of this 36 percent

Executive Engineers are required to report on development matters to the CEO, Zilla Parishad. The R&B division is responsible for Panchayat, Mandal and District roads and the construction of public buildings for the ZP, MPP and the GP. The Works and Employment schemes division takes up public works for the ZP, MPP and GPs, which are in the nature of asset creation activities as part of other development programmes being managed by the district administration. The RWS accounts for about 60 percent of the technical staff in the PRED.

The PRED -RWS is a specialist technical department created to facilitate asset creation by the rural local bodies. It also carries out O&M and Quality Control functions, as most of the panchayats do not have the capacity to carry out these functions. Staffing in this department is heavily engineering dominated. The department has been receiving budget sanctions based on works to be taken up and estimated O&M activities. Hence, the physical targets of completion of schemes are emphasized rather than aspects like service delivery, quality and reliability of services.

In rural areas, the accent in recent years (because of drying up of sources and emerging quality problems) has been on designing and implementing large comprehensive water supply schemes, with no consultation or contribution from local communities. The O&M costs for these schemes prove to be higher than what Gram Panchayats (GP) and Zilla Parishads (ZP) are willing or capable of bearing, despite the directives issued in 1999 devolving more funds to the local bodies and directing local bodies to collect user charges.

The Department of Municipal Engineering & Public Health (ME&PH) plays an important role in asset creation and as a contractor for water supply and sanitation projects in all urban areas of the state (except notified industrial areas and areas in and around Hyderabad served by the HMWSSB). The functions of ME&PH are similar to that of PRED and consist of carrying out surveys and investigations, planning and designing, contracting and construction supervision and quality control. After completion, the assets are handed over to the concerned local urban bodies for O&M. The ME&PH had an annual budget of Rs.50 million till three years ago. Financial resources for these schemes are made available by the state government as loans to the ULBs through internal resources or commercial borrowings from agencies like HUDCO and LIC.

Urban water supply throughout the state, except parts of Hyderabad, Vishakhapatnam and Guntur, is not metered. It is also to be noted that the fixing of user charges (even the flat rate) is decided by the state government and not the urban body. In cases of large schemes and with commercial borrowings, the lack of recovery of any form of user charges is a strain on the local urban bodies and the ULBs find it difficult to meet the total O&M and Quality Control costs. The increase in power tariffs has heightened this problem. In the municipal towns of the state, while provision for drinking water has been made, deficiency of supply remains substantial, thus not allowing increase in the user base for augmenting revenue.

percent of the Net irrigated area in the state. Initiatives for Farmer managed Borewell Irrigation systems in seven districts attempted to make users aware and enforce community norms on crop choice for agriculture (suited for the area and water available) and inculcate active management strategies within the groups for sustainable use.

Water Quality

Andhra Pradesh has both coastal and semiarid hardrock regions, therefore problems of coastal salinity and fluoride are the most common groundwater quality problems in the state. The coastal salinity problems are largely restricted to coastal villages, inhabited mostly by the fisherfolk. Coastal aquifer exploitation is likely to occur if the surface irrigation systems are insufficient to meet agricultural needs. Over-tapping this zone is likely to reverse the current position of fresh and seawater interface, and can result in seawater intrusion as already evidenced in Gujarat and other coastal zones in the country. In the delta area, the major concern is the saline water ingress along the river mouths. Since the coastal belt is nearly flat, over-exploitation of surface water inland may cause back-flow of sea water inland along river mouths. Aquaculture has become quite common along the coastal zone, and this is likely to impact coastal aquifers in the future.

Fluoride is the major quality problem in the interior areas of the state. The fluoride affected districts are Nalgonda, Anantapur, Cuddapah, Guntur, Nellore, Chittoor and Krishna. In each of these districts, some villages do not have any groundwater source free of fluoride. The state government has commissioned many surface water based water supply schemes, to address this problem. In some of the affected areas, water treatment through the Nalgonda process has been attempted but these plants are reported to be mostly defunct now due to poor maintenance. Activated alumina based household and village level treatment methods are being tried out now in the state. The Sathya Sai Trust has set up large surface water based piped water scheme for Anantapur district, to supply the Fluoride affected areas. The O&M of this system is large and the maintenance of the piped system running across the semiarid country side is going to be expensive. Inland salinity is also reported from the semi-arid regions, especially in the Rayalaseema region, but the problem is not very severe.

In respect of water supply, of the 69,732 rural habitations in the state, Fluoride problems are reported from 12,068 habitations and 8,519 habitations have problems of salinity or brackishness. Of the quality affected habitations, about 46 percent have been provided safe sources subsequently. This leaves more than fifty percent of the habitations needing to be provided with safe drinking water.

Institutional Context

The Panchayati Raj Engineering Department (PRED) is the engineering and works arm of Department of Panchayat Raj & Rural Development. The organizational structure of the PRED has the Engineer-In-Chief at the head and the Chief Engineers for RWS, Roads & Buildings (R&B), Works and Employment schemes, Vigilance and HRD under the E-I-C. The span is organized into zones headed by a Superintending Engineer, with Executive Engineers in charge at the District level assisted by Deputy Engineers and Assistant Engineers at sub-district levels. While the Assistant Engineer and Deputy Engineer have to work with administrative coordination from the Mandal Parishad Development Officer, the

As per the the Andhra Pradesh Municipality Act, 1965 (Subsequently amended in 1994, 1997) the Municipal council is empowered, with the sanction of the government, to direct the construction of works for water supply and for controlling the use of all water connections provided. It is also empowered to levy and collect pipeline service charges from every house owner who has been provided a water connection. Most of the Municipalities except Municipal Corporations of Hyderabad and Vishakhapatnam and Guntur, do not have metered connections. Hence, water tax in urban areas of the state, is collected on flat rate and not based on use. The Municipal Councils are empowered, with the permission of the government, to raise funds through bonds and other accepted market options. However, this option has not been exercised by any urban body in the state, so far. After the Constitutional (Seventy Fourth Amendment) Act, the state government issued the necessary rules and also transferred the responsibilities according to the Twelfth Schedule to urban local bodies.

While the 74th CA dictated the constitution of fora for planning at the district level and separate planning bodies for metropolitan areas, this has not been adopted by the state. The GoAP accepted and implemented 13 recommendations of the SFC pertaining to urban local bodies, which included enhanced allocation for water supply schemes in municipal areas and empowering local bodies to enhance user charges. Following this, there have been enhancements in the connection fee (referred to as donation amount) and revisions in water tariff (read as fixed monthly charges), but these have been dictated by the state government.

The Hyderabad Water Supply and Sewerage Act (HWSS) was enacted in 1989 to make provision for water supply, sewerage and sewage treatment in the Hyderabad metropolitan area and establish the institutional framework for this. This Act details the constitution, composition and duties of the HMWSS Board and specifies the necessary powers to manage water supply and sewerage within the metropolitan area defined by the government, including levy of rates, fees, tariffs, rentals, deposits, contributions and other charges in order to provide sufficient revenues to cover expenses.

The Andhra Pradesh Groundwater (Regulation for Drinking Water Purposes) Act, 1996 has been enacted to regulate the exploitation of ground water for the protection of public drinking water sources. This law explicitly denies permission to any person to sink any well within a distance of 200 meters of a manually driven public drinking water source or within 250 meters of a power driven public drinking water source and enjoins any person seeking to sink a well within 500 meters of a public drinking water source to obtain permission from the prescribed authorities and pay a fee as may be prescribed. The Act empowers the Revenue officer (not below rank of Mandal Revenue Officer), on advice from the geologist to declare an area as "water-scarce" for a certain period and restrict extraction of groundwater except for drinking purposes.

There has been a proposal to amend the distance norms and prescribed authorities as part of a more comprehensive Act, currently under discussion with the state cabinet. Punitive measures are recommended and the management and implementation is to be with the PRI, supported by department officials. However, reconciliation of immediate demands from agriculture, sustainability issues and drinking water priorities will be a problem area.

Legislative And Policy Environment

The legal framework for the water supply and environmental sanitation sector is provided by: (a) Acts that relate to state and district level organisations which have a role in providing water supply and sanitation services, (b) An Act that seeks to control groundwater extraction and (c) An Act that aims at advancing public health in the state. The key legislations include:

- a. The Andhra Pradesh Panchayat Raj Act 1994.
- b. The Andhra Pradesh Municipality Act, 1994
- c. The Hyderabad Metropolitan Water Supply and Sewerage Act, 1989.
- d. The Andhra Pradesh Groundwater (Regulation for Drinking Water Purposes) Act, 1996.
- e. The Andhra Pradesh (Andhra Area) Public Health Act, 1939.

The Andhra Pradesh Panchayat Raj Act was enacted in 1994, to ratify the Constitutional (Seventy third Amendment) Act, repealing earlier laws on the subject, and providing for the constitution of Gram Panchayats, Mandal Parishads and Zilla Parishads; and related matters.

The Andhra Pradesh Panchayat Act provides for a list of eleven functions which the local bodies are obliged to undertake - construction, repair and maintenance of buildings, roads, bridges, culverts etc., lighting of roads and public places, construction of drains, disposal of drainage, cleaning of streets and removal of rubbish, etc. The Act also listed 29 functions which the Panchayats may undertake depending on convenience and availability of funds. This include welfare and development functions like drinking water, housing, health and sanitation and water management. Even though the transfer of responsibility for O&M has been authorised by the state government, this has not been effected due to apprehensions of financial burden on the local bodies.

The Provisions of the Panchayat (Extension to Scheduled Areas) Act, 1996 extended the provisions of Panchayats to the Schedule V Areas and enjoined the states to pass appropriate legislation for this extension, keeping consonance with the customary law, social and religious practices and traditional management practices of community resources. The state governments were also enjoined to entrust to Panchayats, the responsibilities of planning and managing minor water bodies².

The recommendations of the First State Finance Commission (1998) included recommendations for increasing incomes of the local bodies and advocating more scientific methodology for assessment would have an indirect impact on the WES sector, the pertinent directives relating to water supply and sanitation sector were the compulsory levy of water tax by Panchayats and special tax on structures larger than 500 sq ft.

² The Government of AP transferred the *planning and management* responsibilities to different tiers within the 3-tier PRI structure. However, on the powers and function (lease out minor water body for specified purpose, regulate use of water from rivers, streams and minor water bodies for irrigation purposes), it has been vague (in such manner as may be prescribed).

Water Policy

In the early decades of planning in the state after independence, water was viewed as a resource that had to be harnessed for agricultural development. Intense focus on water as an agricultural input gradually gave way to a broader perspective during the International Drinking Water Decade (1981-90) which helped to highlight the importance of drinking water in development. The human development paradigm of the 1990s, is reflected in the Eighth and Ninth Plans of the State that address water management, water conservation, less water-intensive cultivation, and replenishment of water sources. Thus, over the decades, attempts to exploit water have given way to managing water resources for sustainable growth with human development.

The Irrigation sector policy prepared by the state government has enunciated the improvement of irrigation efficiency through participatory management of the distribution infrastructure. It also highlights the need to increase cost recovery and provide more user responsive irrigation. The sector strategy also enunciates the need for a Comprehensive Water Resource strategy accounting for domestic, agricultural and industrial uses based on river basin planning. However, steps towards this would be taken only after reforms on distribution management and public expenditure correction achieve a certain degree of stabilisation.

The State Water Conservation Mission (SWCM) was constituted in May, 2000 with the objective of developing a vision and strategy for water conservation and sustainable utilization at the state level. The State Watershed Programme Implementation and Review Committee coordinates line department activities in agriculture and horticulture.

The new guidelines of the Rajiv Gandhi National Drinking Water Mission (RGNDWM) envisage preferential financial allocation for the states which undertake sector reform projects which include 10 percent capital cost sharing and 100 per cent sharing of operation and maintenance costs by users, focus on village level capacity building, and water conservation measures. As an incentive, states implementing such projects will also be entitled to funds remaining unutilised from other states. Work has been initiated for pilot projects in four districts of the state - Chittoor, Khammam, Nalgonda and Prakasam – according to the revised guidelines issued by the RGNDWM.

Sanitation Policy

Over the years, sanitation at the household or habitation level has been managed as a latrine construction programme in an ad-hoc target driven manner, characteristically constrained by funds. Budget limitations of local bodies have resulted in piece-meal³ drains in habitations taken up under annual budgets. This has meant that there have been no systematic improvements to environmental sanitation or hygiene and there is little ownership or incentive to upgrade and maintain these locally. The popular participatory initiatives of the state government like the Janma Bhoomi have been able to organise villagers around issues of cleanliness (Clean and Green Andhra Pradesh), organise community labour to provide

³ Incomplete (due to lack of funds) drains are constructed in settlements which succeed in shifting the accumulation to another part of sometimes the same street. Extension

The Andhra Pradesh Public Health Act, 1939 provides for the advancement of the public health of the Andhra area of the state. It advises the local authority on the appointment of a health officer. The Act details the powers of the Public Health officer in directing the local authority with regard to improvements in water supply, maintenance of public drains, provision of sanitary conveniences and abatement of nuisance. The Health Officer is also empowered to prohibit use of water from suspected sources in case of infectious diseases.

Individual rights for ground water resources were recognised only through land rights and this bestows an undue advantage to those who have economic power, farm size and access to technology. The unrestricted access to groundwater, even at the cost of depriving earlier uses, does not have any mechanism to compensate the user who loses his original share of water due to heavier extraction by the new party. The rules and norms developed by groundwater boards, nationalised banks and state electricity boards, specifying overdraft zones and safe distance factors, have been found difficult to enforce and monitor.

Irrigation

In Andhra Pradesh, state legislation relating to the irrigation sector impact the water supply sector, when viewed from the vantage of comprehensive water resource management. The Andhra Pradesh Farmers' Management of Irrigation Systems Act and Rules, 1997 has enabled the mechanism of water distribution management, maintenance and rehabilitation of surface irrigation canals/drains to be carried out through local Water Users Associations (WUA), which were formed by law and elected. This initiative of the state government, backed with initiatives to train elected members on administration and financial management, is aimed at improving the management of irrigation in the command areas and irrigation efficiency by speedy rehabilitation of canal systems. During this period, the state government has also been able to increase irrigation charges and thus partially reduce state subsidies.

Power

The power distribution in Andhra Pradesh is carried out by a Public sector entity, the Andhra Pradesh State Electricity Board (APSEB), which has been restructured into generation, transmission and distribution companies as a part of the World Bank assisted Power sector reforms project. The agenda for reforms propose a ten year phased plan to move towards real cost pricing, while improving access and quality of service. The tariff revision in 2000 increased prices for domestic consumers by about 25 percent and for public bodies by 48 percent for minor panchayats upto 200 percent for corporations.

Protection of Special Interests

In Andhra Pradesh, several regulations have been made in tribal areas for protecting the tribal communities' interests over land, against exploitation by moneylenders and for debt relief. However, The state government is in the process of seeking appropriate amendments to the laws vesting rights over land with the tribals in the Scheduled Areas. This is to facilitate the opening up and development of the mineral industry, in line with the goals expounded in the Vision 2020.

funds, released by RGNDWM, funds have been sought for the fluoride problem under the RGNDWM sub-mission.

The quality monitoring systems developed by the PRED, have not proved adequate in systematically monitoring water sources, and are currently being revamped. The initiative supported by the Netherlands Assisted Project in Vizianagaram district in this regard, aims at setting up comprehensive surveillance facilities. While the PRED has set up district laboratories for quality monitoring, the Institute of Preventive Medicine has pioneered steps for mobilisation and awareness building in the case of an outbreak.

The Rural Sanitation Programme is being carried out with CRSP and corresponding MNP funds. The mobilisation for this is being undertaken through the Janma Bhoomi Programme and this process is being managed by the PR&RD department. The IEC Cell in the PRED carries out IEC activities relating to sanitation in the rural areas of four coastal districts of Andhra Pradesh. - East Godavari, West Godavari, Krishna and Guntur.

Urban Water Supply and Sanitation

The Department of Municipal Engineering and Public Health is in charge of planning and implementing water supply and sewerage schemes in urban areas. The completed scheme is handed over to the Urban Local Body (ULB) for O&M. With decreased plan outlays, the UWS programme over the last two years has depended on borrowed funds from financing institutions like the LIC and HUDCO at commercial rates. The initiatives in urban water supply sector have ensured rapid completion of existing schemes in about 40 urban locations, with loans at commercial rates from financial institutions. However, the borrowing and non-commensurate cost recovery have resulted in financial liabilities for the urban bodies, of the order of about Rs. 700 million. Also, some of the schemes have relied on distant sources and annual estimated operations and maintenance costs deter the local bodies from assuming charge. As discussed earlier, one major concern is that 10 percent of the ULBs have a service deficiency exceeding 50 percent, and another 41 percent have more than 25 percent deficiency in service provision. Apart from this, there have been progressive initiatives in urban management including rainwater harvesting, out-sourcing and privatisation of essential functions.

The HMWSSB manages the water supply and sewerage in the twin cities of Hyderabad and Secunderabad. The utility has finished the re-laying and augmentation of existing sewerage infrastructure with the assistance of the World Bank. The proposal for augmenting water supply to the city from Nagarjunasagar (about 140 km) is still pending technical clearance with the CWC and financial clearance from the funding agencies. The current initiative to build the Cyberabad Township adjacent to Hyderabad is likely to further strain the capacities of the organisation.

Challenges To Achieving International Development Targets

1. In this predominantly agricultural state, irrigation will continue to be a priority of the farmers. The current pattern of agriculture demands significant support from the state in agriculture. Indebtedness, shift to cash crops and vulnerability to drought, especially in the semi-arid regions, preclude any significant farmer-level investments

drainage facilities in the settlement and also effectively utilise the IEC funds during these bi-annual events.

The performance of the health care system in the state has been constrained by the lower financial priority accorded to it over the Plan periods. Public Expenditure on Health has always been less than six percent of plan expenditure and the fiscal pressures on the state economic management have aggravated this further. The Economic reform programme currently under way in the state has allocated funding for upgrading the health infrastructure.

Vision 2020 and the New Industrial Policy

The state government has identified 19 growth engines on the basis of the resource availability in the state. The effort also charted the route towards ensuring sustainable development in the region by the second decade of the 21st Century. The approach envisioned is to make provision of services demand driven with substantial popular participation. While running of municipal services on a competitive basis, involvement of private sector in developing urban services and infrastructure, and local management and control of local services form part of the urban growth strategy; Harnessing of water resources, stakeholder management of irrigation systems, and integrated development of rainfed areas are expected to stimulate agri-business and contribute to self-reliant rural communities.

The industrial growth strategy also contains elements that raise the likelihood of increased use of water for non-drinking purposes. Viewed at a broad level, the state's plan for industrial development is likely to result in the rise of townships and industrial clusters. The experience of high investment in the urban centres in other parts of the country (e.g. Tamil Nadu), suggest that the demand for water and sanitation facilities would grow considerably with the spurt in urbanisation. While the mega city project is expected to take care of the growing needs of Hyderabad and Secunderabad, appropriate arrangements will need to be worked out in areas selected for the expanding urban townships in other parts of the State.

The changing attitude towards water has however not resolved the competition between water as a resource for agriculture, and water as a resource for drinking purposes. Expansion and development of the agricultural sector incentives provided for irrigation development and subsidies on power, have increased the demand for groundwater based irrigation, leading to depletion of groundwater resources. Since by virtue of the natural resource regime, irrigation development has created and accentuated regional imbalances, the state has had to provide succour in the non-irrigated tracts by other subsidies (lower power tariff for agriculture in drought-prone areas to enable groundwater development).

Existing Programmes

Rural Water Supply and Sanitation

The Rural Water Supply programme is managed by the PRED throughout the state, except for the TSP areas, where it is responsible only for O&M. Full coverage of 14,677 partially covered, 7,874 fluoride affected, and 2,695 brackish habitations is envisaged by 2002. While the partially covered habitations are to be provided from the MNP funds and the ARWSP

7. Correction in public expenditure and increased privatisation would impact the vulnerable and disadvantaged groups differentially and require adequate security nets. In the current paradigm, where the knowledge-based sector and certain growth industries are encouraged, the disadvantaged groups are in danger of slipping further due to inherently lower skill base on one hand and the degrading rural production systems on the other.
8. The state has undertaken the move towards demand responsive strategies and costing for basic services. With hike in charges of power and prices of commodities in the PDS, the political risk would force the government to go slow on any further initiatives towards realising user charges.
9. The Action Plans to realise the vision 2020 are under preparation. The Vision seems to have viewed sectors/opportunities in isolation. The action plan (being prepared departmentally), will see the emergence of inter-sectoral contradictions, which will have to be reconciled, possibly forcing a rethinking of policy and priorities.

Potential Areas For Intervention

1. Andhra Pradesh comprises both water scarce and water surplus regions with varied livelihood patterns. A single norm for water supply fails to capture the needs in different parts and is unable to provide options that can be sustainable in all types of situations. It is necessary to subdivide the state into contiguous zones based on resource endowments, dependancy on water for livelihoods, resource use patterns and capacity of local institutions. This zonation will provide a firm basis for design of regional strategies and intervention options for various parts of the state. Outputs from this exercise can be used for influencing the policies on water resource management and WES sector and also for informing emergent local bodies who take up management of their own systems. Without this, the current across-the-board solutions will continue to be applied, with limited success in the problem regions as evidenced by experiences so far.
2. For the rural water supply systems to be sustainable in semi-arid environments, it is necessary to use ground water sustainably. This would mean adoption of less water intensive cropping patterns and improvement of water use efficiency at farmer level. A key input in this is to improve resource literacy at user levels and effective adoption of ground water resource management at village/watershed levels. The state has already taken up watershed development interventions on a significant scale and is also making movements towards appropriate legislation. The current programmes are constrained in providing inputs to building resource literacy and imparting sustainable water resource management skills at user levels in short time-frames. Resource literacy in low literacy environment would mean new paradigms of education and major inputs in this direction. DFIDI may take up pilot projects with IWRM, resource literacy and capacity building of local institutions, as integral parts of water resource management and WES. Capacity building of local level institutions like PRIs and NGOs to assess natural resources and plan for sustainable water resource development and management should be the key goals in these pilot projects. It would

in water conservation. The ensuing conflict between water for irrigation and water for other uses will remain one of the major issues to be resolved in the near and distant future.

2. The supply side paradigm for provision of drinking water is being sought to be changed with enhanced devolution of financial powers to local bodies and the demand responsive strategies enunciated in the Vision 2020. However, provision of drinking water is still very much supply oriented and administrative actions have been more towards achieving marginal financial corrections and in encouraging private sector/community takeover of certain components. Pilot initiatives like the participatory planning and management project in Vizianagaram, assisted by NAPO, or the proposed sector reform initiatives are few and there has been no concerted move towards decentralisation and local-level planning and management. On the other hand, initiatives like the Sathya Sai Water Supply in Anantapur, and Mahbubnagar districts have raised the aspirations of people and reinforced the idea of drinking water as a free good. Changing this paradigm amongst the population as well as the institutions, will be the major challenge.
3. The responsibilities for operations and maintenance reside with the local administration, but there has been a failure in effecting this, especially in rural areas. The financial burden and mismatch of technology-skill levels are some of the major reasons. The development of a varied technology and management option set suited for local finance and skill availability along with supplementary initiatives to boost finance and skill levels would probably be the only way forward. It is to be noted that this route would require substantial capacity-building of local institutions in terms of technical and managerial skills.
4. Comprehensive quality monitoring and surveillance in drinking water supply is non-existent. Quality monitoring is done by different agencies whose inputs are often uncoordinated. The development of an appropriate MIS which informs, is transparent to users and aids proactive planning is needed. Since the state already suffers from water quality problems such as fluoride and salinity, capacities for local level monitoring and corrective measures are urgently required. Development of these capacities in a low formal literacy environment require careful consideration as is reflected in the mixed results from earlier initiatives with household fluoride treatment.
5. In urban areas, the withdrawal of subsidy elements in the cost water and power has started impacting the household budgets, especially amongst poor. The expanding urban areas in semi-arid areas which have no nearby sources would have to bear the increased costs for drinking water. The urban development strategy which has historically concentrated around a few centres in the state would need to be addressed positively.
6. While there is progress on the individual sanitation initiative, there is the need for follow-up and monitoring. Habitation level planning needs to incorporate Environmental Sanitation to enable planned solutions, in line with provision of water supply.

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH					
	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
A	Support relevant parts of the government to respond to the transition from supply driven to demand responsive approaches	GoAP has made cautious first steps for Pilot projects in drinking water supply. Vision document for state accepts this principle.	Assist in developing state WES strategy taking account of Vision 2020 and other sectoral pulls.	Work with PR&RD, Planning & Finance, MA & UD, ME & PI; Health, Women & Children; Work with ZP and smaller ULBs in parallel	GoAP will cite inability to move to demand responsive approach across all service sectors in view of tariff corrections already in place. Will have to take phased approach and selected areas only in short-term.
		Predominance of supply-driven approach and achievement of coverage for rural and urban settlements	Develop Local/regional solutions; Work on regionalising norms; select strengthening of local urban and rural bodies in selected representative districts.	Work with Line departments and Planning & Finance; make local/regional norms and solution development consultative.	Centralised state level planning and supply-driven approaches will continue as capacity and orientation does not change in the short-term
		Poverty focus and other vision ideas (growth engines) drive policy and public investment	Engage with and assist in providing focus to multiple dimensions emanating; Focus on WES parameters in each sectoral policy	Work with Planning & Finance, CMO and select district administrations	Poverty alleviation schemes devised on formulae and may not be easy to accommodate changes or linkages therein

be advisable to link this strategy for WES with ongoing livelihood, education and health programmes assisted by DFIDI, in the state.

3. PRED will continue to play a key role in the WES sector for the next few years. While it has engineering capacities, its social development and participatory planning skills are limited. Involvement of other possible institutional role players is limited in this state. Unless Agriculture, Education, Health & Family welfare, PRIs, PRRD, Finance, Women & Children, Tribal development and other institutional stake holders are involved, WES goals are unlikely to be achieved in a sustainable manner. The State Water Conservation Mission is a possible coordination agency, but is housed within the Rural Development Department. Therefore, any meaningful programme in WES would require involvement of multiple government agencies.
4. Andhra Pradesh has been in the forefront of initiating reforms towards a more demand responsive approach and costing of services. The Water and Trees bill is currently being discussed and may soon be enacted to regulate groundwater resources in the state. This would assign responsibilities on different stakeholders to maintain assets created by State investment; and aims to ensure management of natural resources in a more comprehensive manner. These efforts call for comprehensive planning and modulation of inter-sectoral interests, if the IDT goals of resource conservation and sustainability are to be achieved. DFIDI could take an active role in the process by continuous dialogue with the state to modulate these efforts to achieve IDT. This would necessitate building a reliable natural resource database and utilising the information available with the government to develop a comprehensive understanding of rural production systems and natural resource use. The strategies derived from zonation of the state based on resources, usage pattern and skill base, can be a first step in this direction.
5. While the state is committed in policy to protect the interests of the poor, the ongoing economic reforms and multi-pronged development strategies being followed by the state are likely to adversely impact the poor and open up new contradictions. DFIDI will need to engage with the situation of the poor and advocate with policy makers, to buffer the identified adverse impacts wherever feasible. Additionally, alternate methods for existing production systems would need to be tried out and perfected, to help the vulnerable groups make use of improved services within their capacities.
6. The Vision 2020 and the goals enunciated thereof bring out contradictions across sectoral interests. There is the need to engage with the state for the development of comprehensive policies, which protect the interests of the poor and are sustainable in terms of resource use.

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH				
Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
	Public agencies are removed from community needs and demands - driven by and accountable to schemes available from State and Centre	<i>Exposure, training and orientation; in parallel, promote local level accountability</i>	<i>Initiate district level monitoring with strong social audit component; work also with auditors of state government to incorporate social effectiveness as part of State audits</i>	<i>It may take a long time to develop accountability to local population - mechanisms may get restricted to accounting and audits only</i>
	Service provision agencies do not have the flexibility and capacities to respond to community demands	Support alternate scheme structure and content - with participation of other government and non-government agencies; May promote mission type teams to provide initial thrust	PR & RD, MA & UD, Health, Women & Children to have roles apart from PRED and ME & PH - task force for selected districts	Coordination and links may be a problem. Will need to expend time and resources on such disaggregated planning and management efforts.
	Schemes and programmes for hilly tribal areas need to be very different from what is appropriate in coastal areas and the semi-arid areas	Work on regionalising state norms; assist in evolving appropriate ownership rights and strengthening traditional resource management systems in tribal areas	Work with Tribal Welfare Dept, PR & RD, traditional tribal councils and develop packages suitable for these communities to own and manage simple and acceptable WES systems	Subsidisation and works may attract external interests from non-tribal areas and from non-tribals in tribal areas

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
		Local governments are yet to be strengthened and are dependant on the state government	Focus capacity building assistance to local bodies starting with DFID assisted project areas	Leverage links with State Water Conservation Mission, Rural Development, PR & RD, MA & UD and include Planning & Finance in overall process	Devolution to local bodies is far from complete in both rural and urban areas
		State Government has engaged with poverty issues and environmental services; but initiatives have been populist in the former and ad-hoc in the latter.	Use CMO, Finance & Planning to provide policy support, dialogues and monitoring (but not operational links)	Other DFID India to assist in these realms including Public Sector Reform, Energy; Local Body Finance for operational links to policy	Operational/ground level programmes are in danger of becoming dependant on the initiative and dynamism of the CMO creating a bottleneck.
B	Promote policies and approaches that respond effectively and efficiently to community demands for WES services	GoAP follows Gol guidelines as central funding tied to this	Provide support from the national level work	Work with Finance & Planning; PRED, MA & UD to develop sensitivity to basic service issues	Demand responsiveness may not be accepted by State government departments in reality - may have doubts of its efficacy

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
		Capacity to manage private sector participation untested except for contracting out of select services. Large investors attracted in mining. Large industries and power sectors. Vision document spells need for private investment in services.	Promote privatisation to link with local employment generation; promote local vendors and contractors	Work with para-statal corporations selectively; dialogue with broad-band forum of private industry in state; engage with local private sector directly; develop local NGO capacity for social and technical work	Para-statals and government may disfavor private involvement; large companies might infringe on protected rights in resource-rich areas
D	Support government's role in encouraging civil society involvement	GoAP has been supportive of NGOs, with increased support to CBOs (at the expense of NGOs) recently.	Capitalise on GoAP initiatives and strengthen technical capacity of CSOs.	Work with NGOs, private sector and other CSOs - especially for advocacy	GoAP may be selectively supportive of CSO efforts but not when opposed to current development paradigms (Vision 2020)
		CSOs/NGOs/CBOs do not necessarily have capacities required for WES work	<i>Help strengthen technical and managerial capabilities local CBOs; Provide forum for leveraging supportive capacities of CSOs</i>	<i>Work with different CSO/NGO networks (not one or two only); help government set an appropriate frame for CSO involvement</i>	<i>Co-ordination of CSO efforts critical; abdication of state agencies of joint responsibilities possible</i>

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
C	Support well-informed strategic decision making processes for allocating water resources, financing services and involving the private sector	Water Resources Sector Policy is driven by Irrigation needs primarily.	<i>Support Integrated Water Resources Management Policy and Practices - allocation, efficient use and local provision</i>	<i>Work with Irrigation, PR&RD, MA & UD; State Groundwater agencies and link with WES programmes</i>	<i>Current legal rights over water and differential resource allocation between end-user departments might hinder effective engagement between agencies</i>
		Irrigation sector pays enhanced user charges and "last mile" management has been decentralised.	Support evolution of policy which brings down the differential cost for irrigation between canal and groundwater irrigated areas.	Work with Finance, Planning, Irrigation, Energy, Agriculture on introducing and sustaining a culture of realistic user charges and community managed contribution funds	Current cropping pattern with high emphasis on Paddy and policy controls on Paddy do not allow much bandwidth for these intra-sectoral negotiations.
		State Irrigation department is moving toward increased participatory management.	<i>Replicate same slowly in drinking water sector; push strongly in urban sector WES services starting with sub-components like SHM, Environmental sanitation</i>	<i>Start dialogue with Finance & Planning, PR & RD, MA & UD, Irrigation, Agriculture, Health and FW to learn and evolve sustainable local management strategies</i>	<i>Poor may be marginalised in terms of access to WES services, especially in mixed communities with resource constraints</i>

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH					
	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional, Strategy	Key Risks to Address
		Centralised Monitoring by state being built up and local accountability mechanisms weak	<i>Assist in enhancing and more decentralised monitoring systems and push for information dissemination to local levels.</i>	<i>Work with PR &RD, Health & FW, MA & UD, Women & Children; Assist selected local rural and urban bodies in decentralised monitoring and push information into public domain with open dialogue.</i>	<i>Resistance from existing centralised systems and technical teams.</i>
		Legal and regulatory framework for poor exists for special classes and areas (e.g. Scheduled Areas Act; National Commission for SC/ST, etc.)	<i>Strengthen implementation and sub-state monitoring arrangements; Use laws to influence norms, service delivery and accountability.</i>	<i>Work with Tribal Welfare Dept, Tribal Development and other special Agencies</i>	<i>Implementation may be weak and restricted to select areas only</i>
F	Help governments adopt and implement comprehensive national/state strategies for sustainable development	GoAP does not have a comprehensive vision of sustainable development. The Vision 2020 does not take a sustainability test	<i>Opportunity to develop and produce state of economy, society, environment papers (e.g. HDRs) and promote linking investments to indicators; begin with WES and related sectors in parallel</i>	<i>Work with Finance & Planning, CSOs, State Planning Board; District Offices</i>	<i>This may become a block before which other activities are sensibly initiated</i>

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
E	Work with government to ensure poor people's interests are reflected in legal policy and regulatory framework	GoAP is committed in policy to protect the poor	<i>Strengthen vision, perspectives and knowledge base of State planners and policy makers; sensitise to importance of WES in poverty</i>	<i>Work with and strengthen State Planning Board, Civil Society and Research Networks; Engage with the CMO and Finance & Planning in building information base and monitoring</i>	<i>Poverty focus may continue to be given priority but only in terms of more financial investments; WES may continue to be seen as mere service provision</i>
		Policy to ground operations do not protect the poor	Strengthen policy, planning and output links in WES sector	Work with PR & RD, Health & FW, MA & UD, Women & Children to highlight the primacy of safe drinking water and Environmental Health in poverty and livelihood improvement; Assist in build-up of monitoring for enhanced Health focus.	Exercise may become academic due to differing foci of institutions

ANDHRA PRADESH

BACKGROUND

Andhra Pradesh is the fifth largest state with an area of about 275,000 sq km, and is the fourth most populous state in the country (after Uttar Pradesh, Bihar and West Bengal). The state had a population of 66.5 million in 1991, 73 percent of whom live in rural areas.

Andhra Pradesh has 23 districts, divided into revenue mandals (about 20-35 villages) for the purposes of revenue collection, planning and administration. The state can be divided into three regions - Coastal Andhra, Rayalaseema and Telengana on the basis of history and socio-cultural moorings. The tribal dominated hilly areas which spread across the Telengana and Coastal Andhra regions can be considered a fourth zone as they are particularly under developed and have a unique set of problems. With two major river systems passing through the state and draining into the Bay of Bengal, the state has areas rich in water resources as well as semi-arid regions which are largely rainfed. Droughts and scarcity of water in summer months are a recurrent phenomenon in these semi arid zones.

The proportion of urban population (1991) increased to 27 percent from its share of 23 percent in 1981, but at a slower rate of 15 percent as opposed to the population growth rate of the state which had witnessed a growth of about 24 percent over the 1971-81 decade. During the same decade, Andhra Pradesh reported more than 50 percent growth in slum population. More than thirty percent of the urban population in the state resides in secondary cities (population more than 0.1 million) and these cities have recorded a decadal population growth of over 65 percent during 1981-91.

I. SOCIAL ENVIRONMENT

Economy and Employment

Agriculture continues to be an important contributor to the state economy and the changing structure of the state economy is reflected by the fact that between 1960-61 and 1995-96, the share of agriculture declined from 59 percent to 38 percent while the tertiary sector increased its share from 29 percent to 43 percent. Mining, manufacturing, construction and utilities together increased their share from 12 to 19 percent. During the nineties, there has been a significant decrease in the share of agriculture in the NSDP while construction and transport sectors have shown an increased share. The state investment in irrigation has been spread thin over multiple projects resulting in non-completion and cost over-runs. Only a third of the investments projected for the manufacturing sector materialised during the eighth plan period, partly attributed to the power situation in the state.

However, the shifts in the sectoral share of income generation has not been followed by a similar shift in the work force. While the share of income from agriculture has declined from 59 percent to 38 percent over the period from 1960-61 to 1995-96, the shifts in workforce away from agriculture during the same period is far less and estimated between four and six percent, thus implying that rate of growth of incomes in agriculture was lesser than other

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
		Significant DFID; Multi-lateral; and INGO presence is an opportunity	Coalesce and facilitate all externally agencies links and visions; agree on a basic minimum approach (Bangladesh Model) to WES work	Work with partners; Planning bodies, CMO and CSOs	Partners may not agree to a common strategy or may just become a forum which lowers targets
		GoAP and NGO links with national bodies and agencies are well-established	Focus on agenda on WES nationally as it devolves on state	Work with national GO; NGO and other donor partners	Donors and partners may continue to increase disbursements without critical analysis and joint partnering
		Extractive and resource centered projects (as opposed to people-centered) will remain attractive for state to attract investments and appropriate rents	Select and work on WES in quality problem areas; primitive and backward areas; then, select areas in mixed environments.	Work with Select District Administrations, Tribal Welfare; Tribal Development Agencies; NGOs; Health departments - establish WES links with Environmental health and livelihoods	Efforts may require keeping in abeyance the current demand responsive approach to tackle urgent health issues.

Access to Drinking Water

Most households in rural Andhra Pradesh get their drinking water from tubewells or open wells. In 1991, tanks provided drinking water to only four percent of households, while rivers and springs were used by three percent of households (Census of India, 1991). Piped water supply was available to only 14 percent of the rural households. This reflects the very high reliance on ground water for household purposes in the state. In urban areas of Andhra Pradesh, piped water supply was available to 73 percent of the households (1991), while 24 percent get their drinking water from wells and tubewells or handpumps.

In 1991, only 8 percent of the households in rural Andhra Pradesh had access to exclusive water sources, while a majority of the houses (88 percent), collected their drinking water from community sources. When compared with the All India averages, the proportion of houses relying on community services was greater in Andhra Pradesh. In urban areas of Andhra Pradesh, 15 percent of houses had exclusive use of a drinking water source, while the all India average was 35 percent. This reflects the comparatively iniquitous access to water sources. About 56 percent of urban houses have to rely on community sources for drinking water which, as in rural areas, is much greater than the All India average of 39 percent. Further about a fourth of the houses in urban AP rely on a common-to-building source of drinking water.

By 1993 (NSS 49th round) 61 percent of the households reported access to safe drinking water, while the remaining households depended on dug-wells and surface water sources like rivers or canals. Only 11 percent of households reported access to safe drinking water within their premises, indicated the continuing burden and time spent in collecting drinking water for the households.

Nearly 70 percent of the rural population is reported to have been covered by provision of safe drinking water (PRED, 2000) as per the planning norms. However, more than half of the quality affected habitations are yet to be covered. A clearer picture of access to drinking water provisions will be available only after the 2000 census.

Access to Sanitation

About 7 percent of the rural households in Andhra Pradesh reported sanitation facilities in 1991 (Census of India, 1991). By 1994, the proportion of rural households with sanitation facilities had increased to 14-15 percent (NSS 49th round and NCAER). However, the percentage of latrines with flush water facilities (three percent) is lower in rural Andhra Pradesh as compared to the national average (9 percent), which reflects the poor availability of water within premises in rural areas of the State.

The state government has initiated a campaign under the Janmabhoomi to ensure provision of Individual Sanitary Latrines to all households below the poverty line. The state government augmented its spending during 1997-98 with matching grants from the CRSP. This initiative is being implemented by the Mandal development authorities with assistance from the PRED and APSHC. Over a million latrines are reported complete under this initiative. Demand responsive approaches like Rural Sanitary Marts have been initiated in a few districts. Studies in select districts (TARU, 2000) show that the success of the initiative is very much

sectors. The distribution of factory employment across districts show that 56 percent of employment in industries is concentrated in the 6 districts of Hyderabad, Rangareddi, Medak, (in the catchment of Hyderabad city) and in the coastal districts of Guntur, Vishakhapatnam and East Godavari. The Vision 2020 statement of the GoAP has identified thrust areas for development as Agro-processing, Dairying, Leather and Garments and Petrochemicals in the manufacturing sector; small scale services and the IT in the services sector and restructuring of state finances to enable all round development and creation of self-reliant rural communities. The New Industrial Policy (1995) which aims at an ambitious 20 percent annual rate of growth would entail substantial private investment, which would hinge on the support infrastructure being in place. The proposed investments in industry (as of 1999) amount to Rs. 550,000 million with significant investments in the Petrochemical and Plastics category and their distribution continues to be in favour of the existing spatial concentrations.

Andhra Pradesh is the conjunction of major road and rail lines linking southern states to the eastern and northern parts of the country. Parts of Rayalaseema and Telengana are not yet connected by broad gauge rail lines, and this has posed a constraint to their economic development. The long coast line has provided opportunity to develop ports at three locations in the state - Machilipatnam, Kakinada and Vishakhapatnam. Vishakhapatnam is used largely by the navy and also by vessels from the far East, transporting iron ore and steel. This port is anticipated to become the hub of freight and petrochemical transit between the Gulf and the far East. The berthing facilities at the Vishakhapatnam port are proposed to be increased in the near future.

Living Conditions

Housing and Settlements

Housing in Andhra Pradesh is being transformed at a rapid rate over the last few decades. This is on account of changing aspirations, easier access to industrially produced materials, a responsive and vigorous government housing programme and impact of market forces which has made the use of some of the traditional materials uncompetitive. Changing housing conditions also place demands on energy for thermal comfort, lighting as well as towards meeting the changing aspirations for basic environmental services.

According to the 1991 Census, there were 10.3 million rural residential households in the state. The rate of growth of rural housing stock increased from about 18 percent during the 1971-81 decade to 29 percent within the 1981-1991 decade. There is a visible shift towards the use of manufactured materials for construction, viz. bricks and cement concrete. More families in rural areas of Andhra Pradesh live in rented dwellings compared to other parts of the country and these are also comparatively smaller in size.

In urban areas, most houses are built to accommodate a tenant, as urban congestion has led to high real estate prices and optimization of space use by house owners. Among urban houses, 93 percent are used only for residential purposes, two percent as residence-cum-factory while the balance five percent are used for purposes other than residential. This is lower than the national average of seven percent.

The state is characterised by a high level of regional heterogeneity in terms of Total Fertility Rate (TFR). The TFR estimates vary from 1.9 in West Godavari to 3.9 in Adilabad in 1995. The available data from the Sample Registration System (1994) and National Family Health Survey (1995) indicate that the state has been experiencing a rapid fertility decline in recent years. This rapid decline in TFR for Andhra Pradesh during the 1980s and 1990s is comparable to decline rates achieved by the states of Kerala and Tamil Nadu, who have managed to reach near replacement levels of population growth. The achievement of lower TFR without correlated improvements in variables like female literacy, urbanisation levels and economic well-being seem to suggest that there has been a different dynamic working in the state, possibly explained by literacy in the coastal region and higher levels of women's work participation outside the home and hence exposure, in the Telengana-Rayalaseema region.

Communicable diseases constitute about 54 percent of the total burden of disease, non-communicable diseases about 34 percent and injuries about 16 percent. Andhra Pradesh reports about 70,000 diarrhoea deaths (GoAP insert in print media, 1997) annually. The short-term morbidity prevalence rate is 132 per thousand population (NCAER, 1999), which is higher than the national average of 122. The prevalence rate for diarrhoea is 36 per thousand population, which is higher than the national average and the highest amongst the southern states. The private health sector is large in Andhra Pradesh with only 15 percent of the doctors employed in the government sector. While services provided by the government are the main source of preventive care, the private sector plays a more dominant role in diagnostic and curative services. The private sector accounts for over 80 percent of health expenditures, almost all of which is out-of-pocket spending. This high level of reliance on out-of-pocket sources places a disproportionate burden on the poor. Quality private health services are inaccessible to large sections of the rural population and do not cater to many of the diseases most common among the poorest and most vulnerable sections of society.

Vulnerable and Disadvantaged Groups

The tribal population (6 percent of total population) in the state resides mostly in the Tribal sub-plan areas. Five Integrated Tribal Development Agencies, at the district level and one Integrated Tribal Development Project (for the *Chenchu* tribe) were set up during the Fifth Plan period to administer the Tribal Sub-Plan areas in the districts. The literacy rate for the Scheduled Tribe communities in Andhra Pradesh is about 14 percent, which is the least amongst the southern states. The IMR in tribal areas in Andhra Pradesh is in the 120-212 per 1,000 live births range, compared to 73 in the non-tribal districts. A key problem faced by tribals are degrading forest environments leading to loss of livelihoods and inadequate basic services, which arise also in part due to inaccessibility of terrain.

In 1991, Andhra Pradesh had a SC population of 10.59 million (15.93 percent of the total population of the State). Literacy level among SC's (25.89 percent) is below the national average, and many SC households live below the poverty line. Consequently, most state initiatives for the welfare of SC are education and economic support programmes. Many SC localities in the state are observed to be characterized by congestion, insanitary conditions, and lack of basic amenities including safe drinking water. The State Social Welfare Department provides funds for civic amenities to SC habitations. The Ninth Plan allocation for these community services was Rs.5 million. With a view to promoting general awareness

dependent on linkage with the government programmes and there has not been much success in initiating the demand for sanitation.

Access to Electricity

About 63 percent of all households in the state report access to electricity which is higher than the national average of 43 percent and is among the highest in the four southern states. Only states of Haryana, Punjab, Himachal Pradesh and Gujarat report a higher rate of domestic electrification. The areas of concern however are that a little over half (53 percent) of the low income households have access to electricity while among the SCs and STs, the proportion of households with electricity is lower at 47 percent (NCAER, 1999).

TABLE (1): ACCESS TO HOUSEHOLD AMENITIES IN AP AND ALL INDIA AVERAGES					
Amenity/ State	Income and Social Group				
	<Rs.20,000	Rs. 20,001 - 40,000	Rs. 40,001 to 62,000	> Rs. 62,000	SC and ST households
Electricity					
AP	53%	71%	81%	96%	47%
All India	32.6%	50%	63%	76%	30.4%
Protected Water Supply					
AP	79%	84%	74%	69%	78%
All India	70%	75%	75%	78%	69%
Individual Toilet					
AP	10%	18%	25%	43%	8%
All India	10%	20%	27%	31%	9.6%
<i>Source: India Human Development Report, NCAER, 1999</i>					

Table (1) indicates that while households in Andhra Pradesh have better access to household amenities than in other parts of the country, differentials across socio-economic groups are high which are likely to be heightened with measures that aim to remove subsidies particularly in view of the fact that agricultural incomes are under pressure through the same set of measures and agriculture continues to be the primary livelihood for the vast majority in the state.

Health Conditions

The sex ratio in the state (following trends at the national level) has been declining steadily from 986 in 1951 to 972 in 1991. Although the state average is better than the national average of 927, it is the lowest among the four southern states. The IMR is marginally lower than the national average (77 as opposed to 81) but again is the highest among the four southern states.

among SCs, the State government finances opening of libraries in scheduled caste habitations.

It has been observed that early childhood deaths among SCs, especially in rural areas, take place due to malnutrition. The Ninth Plan proposed to provide nutritious food throughout the year to more than 15,000 poor SC girls in the age group of 0-6 years.

The work force participation rate in the state is high at 45 percent, among the highest in the country (All India: 38 percent) but the per capita income is lower than the national average (AP: Rs 8,938, All India: Rs. 10,771, in 1996-97 (Quick Estimates), at current prices) across all years over the last decade. The rural female work force participation rate in the state is high (36 percent in 1991) and is increasing but literacy levels among rural women are poor and the male-female literacy differential is as high as 27 percentage points in the Rayalaseema region of the state. The wage rate for women on an average is 30 to 40 percent lower than for men, across the state. These factors indicate that while the burden of work on women is increasing, they are largely in the low paid sectors, their capacity to take up more value added work with a lower component of drudgery, is not being enhanced.

Poverty

The proportion of agricultural labour among rural main workers is already high at about 41 percent. The proportion of cultivators among main workers is declining (about five percent over 1981-91) and there is an almost commensurate increase in the proportion of agricultural labour. The area under food crops is declining and cash crop cultivation has become more risk prone due to a variety of external factors (culminating in the reported suicides of cotton farmers in the state in 1998). These indicate that agriculture, which continues to be the mainstay of the rural economy, is becoming more risk prone and coping abilities of the large agricultural population may be declining, a matter of concern in a period of large scale structural adjustments in the economy.

According to recent estimates, the population below the poverty line in AP has declined significantly and is currently reported to be about 21 percent (39 percent for All India)¹. An analysis of poverty trends in rural Andhra Pradesh using time series NSS data over the 1957-94 period indicates that the average Head Count of Poverty (H) which measures the proportion of population below the poverty line, or the extent of poverty remained as high as 64 percent during the entire 1957-1973 period which more or less reflected the national trend although the value in Andhra Pradesh was higher than the all-India average. The steep reduction in H during the last two decades, seems to reflect the greater effectiveness of poverty eradication strategies in the state.

In the urban areas, the head count of poverty was low to begin with and has reduced at a slower rate than in rural areas. In 1957, it was 48.5 percent reducing by 1994 to 31 (NSS 50th round). The lowest point was reached in 1990-91 (NSS 46th round) when the head count of urban poverty touched an all time low of 28 percent. Analysis of NSS data over time, indicates that while the overall level of consumption in urban areas is higher and the poverty levels lower, the distribution effects are more skewed than in the rural areas.

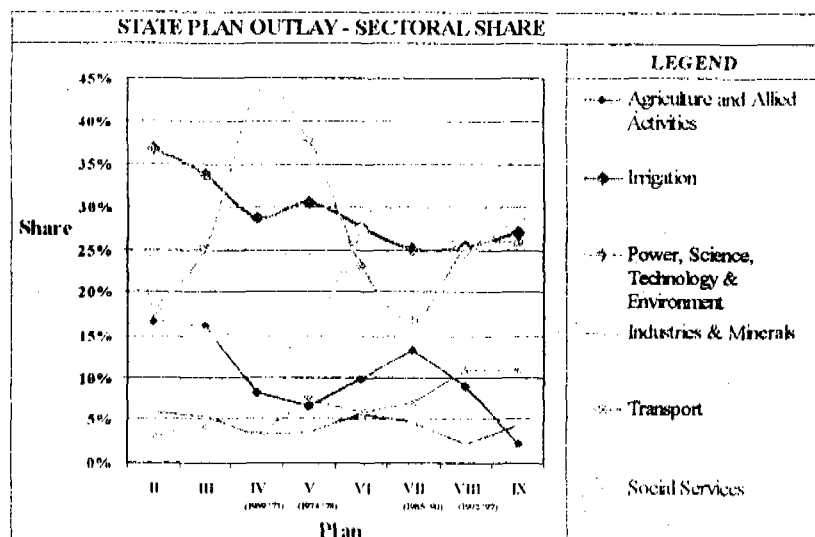
¹ The rural poverty line is defined by the Planning Commission as the per capita monthly expenditure of Rs. 49 and the urban as Rs. 57 (rounded off to the nearest rupee) at October 1973-June 1974 all-India prices. They correspond to the norm of per capita intake of 2400 calories per day in rural and 2100 in urban areas.

The Capability Poverty Measure (CPM)² is 42 percent for Andhra Pradesh as compared to 36 percent in case of developed states like Punjab (the All India figure is 52 percent). The literacy rate for population above the age of seven is only 50 percent in Andhra Pradesh, lower than the national average of 54 percent. The NSS also reports that in rural Andhra Pradesh, 13 households in every 1,000 households do not even get to eat two square meals a day right through the year. The periods of higher stress are the months of May and June when the number of such households increases to 20 and 18 per 1,000, respectively. In urban areas of the state, 7 households in every 1,000 do not have access to two square meals a day while during the periods of stress (September), the proportion of such households increases to 12 in every thousand.

The shift in Plan priorities in the 1980s towards social services can be attributed to a number of regional, national and international factors. Politically, Andhra Pradesh for the first time, witnessed the rise of a non Congress regime - The Telugu Desam Party, which rode to power in 1983 taking a pro-poor stance at the time of elections, and huge allocation for social services and welfare programmes, especially for the benefit of SCs, STs and Other Backward Classes, was a way of signalling the party's commitment to its manifesto. Further, in a state where populism had been an ingredient of the strategy to retain state control, political support for social services outlay was easily forthcoming from a new party in the political arena.

The Andhra Pradesh experience in recent years (from the mid-eighties) has been a continued increase in revenue expenditure, including that on social services. With the spread of social services, operations and maintenance costs also rose further aggravating the deficits on the revenue account. However, revenues from economic services that could have been channeled towards maintaining the social services, were limited due to both economic and political constraints.

Social Sector Spending in Andhra Pradesh



² A simple measure of the average percentage of births unattended by trained health personnel, percentage of stunted children and female illiteracy rate

The sub-sectors that fall within the broad head of Social Services are, Education, Sports and Youth Services, Technical Education, Art and Culture, Information and Publicity, Medical and Public Health, Water Supply and Sanitation, Housing, Urban Development, Welfare of SCs/STs/BCs and Minorities, Labour and Employment, Social Security and Welfare, and, Nutrition.

In terms of outlay, Water Supply and Sanitation, General Education, and Housing received the maximum allocation in the Fourth and Fifth Plans. In the Seventh and Eighth Plans, the major sectors (in terms of absolute outlay) were Water Supply and Sanitation, and Welfare of SC/ST/BCs.

In terms of expenditure, the major sectors (Fourth, Fifth and Seventh Plans) have been Welfare of SC/ST/BCs, Water Supply and Sanitation, and General Education, while in the Eighth Plan (1992-97), in a significant departure from earlier Plans, Sports & Youth Services, Art & Culture, and Nutrition experienced huge increases in outlay. Outlay on education was less than that in the Seventh Plan, while the increase in outlay on health was only marginal (1 percent).

For the Ninth Plan, data availability of revised outlay is limited to two years - 1997-98 and 1998-99. There has been a significant increase in the outlay for health, almost wholly due to the externally-aided Andhra Pradesh First Referral Health Systems Project. The outlay on health for the initial two years (Rs. 3,305 million) exceeded the total outlay in the sub-sector during the 8th Plan (Rs.1,581 million). The increase in outlay for adult education has also been on similar lines (Rs.450 million in the first two years of the Ninth Plan, compared to Rs.370 million during the Eighth Plan).

Thus, while the stated strategy of the government has been to reduce un-targeted subsidies in various sectors and release funds for developmental programmes, the pattern of expenditure on these sectors and the ability to leverage these for improved performance in the social sectors, is an area of concern. While there can be little argument for improved targeting of subsidies, the concomitant steps of better delivery of social services to the poor may not be as easily achievable.

II. WATER RESOURCES

The major part of the state lies in the plateau zone lying about 600 m amsl toward the west. There are few isolated hills in this plateau and it is underlain by Archean granitoids. The majority of this plateau (parts in the state) is drained by Krishna river and its tributary, Tungabhadra. The northern part of the state lies in the right bank of Godavari river. Towards the northwestern part of the state, Deccan traps and associated black cotton soils are found.

The Eastern Ghats form a series of disjointed hill ranges parallel to the coast along the western border of the coastal plains. Towards their northeastern part bordering Orissa, the Eastern Ghats are continuous hill ranges and have elevation as high as or more than 1200 m amsl. River Godavari cuts across these ranges. These ranges have some of the best forests in the state and are inhabited mostly by tribes. The distribution of area and population under different physiographic regions in the state is presented in Table (2).

TABLE (2): PHYSIOGRAPHIC REGIONS IN ANDHRA PRADESH						
Physiographic Regions	No. of Villages	No. of Towns	Percent to Total Area	Rural Population Density* (per sq km)	Percent of Rural Population	Percent of urban Population
Coastal Plains	3,684	54	9%	382	18%	21%
Plains (Interior)	11,508	114	40%	201	45%	42%
Uplands	4,397	43	15%	184	16%	29%
Plateaus	1,559	13	7%	158	6%	3%
Riverine tracts	2,523	2	3%	150	3%	1%
Forests	4,615	16	15%	88	8%	3%
Hills	1,414	10	10%	57	3%	1%

Source: Regional Divisions of India – A Cartographic Analysis, Andhra Pradesh, GoI
 * Projected from 1981 data

The average rural population density of the state was about 175 persons per sq km in 1991. Highest population densities are reported from the agriculturally well-developed coastal plains. This has 9 percent of the area but houses 18 percent of the rural and 21 percent of the urban population. With excellent aquifers in this region, water shortage is not a major issue but these areas have problems of saline aquifers which necessitates long distance conveyance of water to some of the coastal communities. This region is one of the most irrigated regions of the state.

The plains and uplands of the state lie in the hard rock region. The southern part of the state lies in semi-arid zone and rainfall variability is quite high in most parts of these plains and upland regions.

The population densities of plains and upland regions are more than the state average. Some parts of these land types have high fluoride bearing groundwater. There are pockets of groundwater over-exploitation in these regions. Regular summer water shortages and occasional droughts are quite common in these regions.

The lowest population densities are reported from forest tracts and hilly regions located mostly in the North eastern part of the state. The tribal settlements are generally dispersed and often hamletted. Since most of these regions are less accessible due to terrain conditions, transportation of rigs is a major problem. Groundwater availability is restricted to very few aquifers due to terrain conditions in these regions. A large proportion of the numerous streams in these regions have water during most part of the year and they are one of the common sources of domestic water. Water from these streams is often polluted due to utilisation by settlements en route and free use by animals, especially during the lean seasons. Perennial springs are another important source of water, especially in laterite-capped hill regions. Spring sources are tapped directly and usage at the spring itself often pollutes the sources.

Geology

The geology of the state is dominated by rocks ranging from the Archean to the Gondwana period. The coastal region with recent alluvium forms the youngest rocks. Most parts of the state lie in Archean and Pre-Cambrian terrain. Granites and high grade schistose rocks are the most common rocks in this state. Eastern ghats contain Khondalites and Charnockite suite of rocks. Khondalites are mostly high grade metamorphosed sedimentary rocks.

The central and western part of the state is covered by Archean rocks. These have been eroded and isolated hillocks of granitoid rocks are common features in these otherwise monotonous plains. These rocks have developed secondary porosity due to repeated structural disturbances and often form good aquifers especially in the vicinity of faults. In the rest of the areas, they are poor aquifers and the groundwater is mostly restricted to weathered zone.

Cuddapah group of rocks belong to Proterozoic period (0.5 to 1.6 BYBP). These formations form an arcuate belt, nearly parallel to the coast with the southern end in Chittoor district and the northern end at the tri-junction of Guntur, Khammam and Nalgonda districts. They form good aquifers at places.

The Gondwana sedimentary rocks are exposed along the Godavari valley bordering Madhya Pradesh on the northeastern part of the state. They are found in the eastern edges of Adilabad, Karimnagar, Warangal and Khammam districts. They comprise sandstones, shales and coal. Some of the sandstones are good aquifers. Deccan Traps, belonging to Cretaceous to Tertiary age, are found along the north-western border of the state with Maharashtra and these have a few good aquifers.

The Rajahmundry sandstones belonging to Mio-Pliocene age, are found as a small pocket near Kakinada and are overlain by coastal sands and recent alluvium. The coastal sands and alluvium form a linear belt along the eastern coast and their width is maximum along the Krishna and Godavari delta region. The thickness of alluvium often attains the thickness of few hundred meters but the deeper aquifers in the area, are reported to contain highly saline water.

Rainfall

The average rainfall over the state is about 1,000 mm but this is unevenly distributed across space and time. The northern hilly and coastal areas receive more than 1,000 mm while the southwestern Rayalaseema receives less than 700 mm of precipitation. Rainfall increases towards the North and the North eastern parts of the state. Coefficient of variability of rainfall is fairly high especially in the Rayalaseema region.

The southwest monsoon contributes nearly 80 percent of the annual rainfall in Telangana, 75 percent in Rayalaseema and 50 percent in Coastal Andhra Pradesh. Cyclonic disturbances in the Bay of Bengal, especially during winter, cause heavy rains in the coastal regions. Most of the plateau experiences hot dry climate while the coastal region is hot-humid to sub-humid. Droughts and crop failures are quite common in the interior parts of the state owing to the regional and temporal rainfall pattern.

Ground Water Resources

About 84 percent of the state is underlain by crystalline and consolidated formations. The rest of the area is either has alluvial formation or coastal sandy zones. The aquifers in hard rocks are restricted to secondary porosity caused by folding and faulting. The hard rock aquifers are sparse and disseminated. The hard rock regions of Andhra Pradesh can be broadly classified in to Granitic and Proterozoic regions. The Proterozoic sedimentary regions are situated in an arcuate belt running parallel to the coast comprising districts bordering coastal districts. The secondary porosity has developed in these rock formations by folding of these sedimentary rocks. The hydraulic properties of these formations improve only in areas where tectonic activities have taken place; otherwise these formations are fairly impervious. Since most part of the hard rock regions, especially the Rayalaseema districts, are located in semi-arid areas, groundwater availability is likely to be low and competing demands from agriculture can put a severe strain on drinking water availability during summers. Most of the groundwater extraction for agriculture is carried out during the rainy and winter months and wells can go dry before the onset of summer season.

The ratio of Gross irrigated area (GIA) to Gross sown area (GSA) in the state grew from 35 percent in 1980-81 to 43 percent in 1997-98. The ratio of ground water irrigated area to total irrigated area in the same period grew from 26 percent to 51 percent. Significant growth in ground water irrigation is reported from the interior hard rock zones which is a matter of concern.

Since more than 80 percent of the population is situated in the hard rock regions, ground water availability becomes a critical issue to ensure drinking water availability in this state. About 44 percent of the total population in the state, reside in the plains areas which are mostly the areas amenable to surface irrigation through large irrigation projects. A part of this region type is already covered under irrigation projects. The remaining 36 percent population is located in the uplands, plateaus, hills and forested regions. Groundwater availability becomes critical for these regions since they do not have surface water options. The rural population in all these regions is more than three fourths of the total population of these regions, except in case of uplands (64 percent, due to location of Hyderabad in this region type).

Out of the total 1,104 Mandals in the state, six mandals were classified as "over-exploited" (more than 100 percent of utilisation of renewable groundwater resources) and 24 mandals were categorised as "dark" (85 to 100 percent utilisation). Except for one mandal, all of them are situated in the hard rock regions. The worst impacted regions are located in northern Telangana and Southern Rayalaseema.

Since groundwater estimation is done at Mandal/block level, a correct picture of village wise groundwater utilisation does not emerge clearly. In many mandals, which are "grey" or even "white", pockets of over exploitation may be present. The methodology itself has limitations which is unable to account for wide variations in aquifer conditions, especially in hard rock regions. The recent (Kharif, 1999 and Summer, 2000) droughts and drinking water shortages across the hard rock regions of the state indicate need for village/ micro-watershed level holistic assessment considering both surface and ground water resources and extent of development and usage patterns. The droughts of 1999-2000 of Andhra Pradesh are a grim reminder to the extent of deterioration in ground water availability.

Surface Water Resources

Krishna and Godavari are the two major rivers flowing through the state. Pennar, Vamsadhara and Nagavalli are the three smaller rivers of a total of 34 rivers flowing through the state. All these rivers carry an estimated total of 18 mham of water to the Bay of Bengal. Being a riparian state, Andhra Pradesh has the share of water from the Krishna and Godavari systems. The state has on-going river water disputes with other riparian states. A significant proportion of the waters from the Krishna has already been tapped while the full potential of the Godavari are yet to be tapped. The utilisable water resources of the state are estimated to be about 7.74 mham, at 75 percent availability. In 1991, Andhra Pradesh had a live storage capacity of 2.472 mham, 0.2433 mham projects were under construction and another 0.1984 mham storage capacity projects were under consideration.

This state has a large number of tanks of various sizes dating back at least five centuries. Large-scale irrigation development on an organised scale, was started during the Colonial period. The Godavari delta irrigation scheme was implemented by Sir Arthur Cotton towards the end of the last century. This was followed by the Krishna delta scheme. After Independence, several large projects were taken up in the interior areas, the Nagarjuna Sagar project, being the largest one.

The GIA from all surface sources was 3.1 mha in 1980-81 which declined to 2.85 mha in 1997-98. In 1980-81, the share of surface sources in irrigation was 74 percent in 1980-81 which reduced to 49 percent in 1997-98. There have been marginal fluctuations in the area irrigated by project canals which seem to respond the rainfall pattern. Decrease in area irrigated by surface sources is a matter of concern as this indicates that the surface irrigation systems are decaying due to poor maintenance or facing management problems. This can cause a decrease in ground water recharge on one side and increase in groundwater usage in the canal command areas, especially at the edge of the command areas. Andhra Pradesh has enacted Farmers' Management of Irrigation Systems Act and Rules in the 1997 and has transferred some of the maintenance functions to the Water User Associations. It is expected that these will improve the performance of canal irrigation significantly but results from the ground are awaited.

Tanks were an important source of irrigation, especially in the interior semi arid parts of the state. Tanks provided irrigation to areas not amenable to irrigation by large irrigation projects. The net area irrigated by tanks increased from 0.763 mha in 1950-51 to 1.23 mha in early 1960s. There has been a continuous decline since, in the area irrigated by tanks. This decline may partly be attributed to coverage of tank irrigated areas under the command areas of project canals, but the continued decline since the early 1980s (by which time, most canal projects were over), is a matter of concern. The net irrigated area from tanks decreased from 0.9 mha to 0.56 mha during the 1980-1997 period. There has also been no significant change in irrigation intensity of tanks.

Tanks are distributed over the semi arid parts of the state and they play an important role in groundwater recharge in these areas. Poor maintenance of these tank systems have resulted in reduced storage capacity and it makes them vulnerable to breaches during the heavy rainfall periods, which are quite common. Since there were many villages that prospered due to the irrigation by tanks, decrease in tank irrigation often has led to increased dependence on groundwater for irrigation which has in turn led to water shortages during summer.

Lift irrigation systems have been installed in parts of the state, which rely on seasonal streams and their quality depends considerably on the rainfall pattern and local factors like catchment area and upstream withdrawal. The Andhra Pradesh State Irrigation Development Corporation provides financial and technical assistance to farmers from amongst the backward groups to set up group-owned LI systems. The irrigation from LI sources account for less than four percent of the Net irrigated area in the state. These are groundwater dependent with borewells as source for a group of farmers. However, the transfer of borewells to the farmers in 1995, without adequate preparation of user groups, resulted in poor upkeep of these irrigation systems. The Netherlands-funded AP WELL undertook initiatives in Farmer managed Borewell Irrigation systems in seven districts of the state with the target of creating 3,300 drilled wells, rejuvenating 500 borewells and establishing a network of observation wells. This initiative, which is farmer-based, has attempted to make users aware and enforce community norms on crop choice for agriculture (suited for the area and water available) and inculcate active management strategies within the groups for sustainable use. It is to be noted that the farmer in this project pays Rs. 0.50 per unit of electricity consumed, the norm set by the Ministry of Power.

Water Quality

Andhra Pradesh has both coastal and semi-arid hardrock regions, therefore problems of coastal salinity and fluoride are the most common groundwater quality problems in the state. The coastal salinity problems are largely restricted to coastal villages, inhabited mostly by the fisherfolk. During the last one decade, groundwater over-exploitation is reported from one mandal of West Godavari district. Coastal aquifer over-exploitation may grow if the surface irrigation systems are insufficient to meet agricultural needs. In the delta area, another major concern is the saline water ingress along the river mouths. Since the coastal belt is nearly flat, over-exploitation of surface water inland may cause back-flow of sea water inland along river mouths.

Aquaculture has become quite common along the coastal zone, and this involves storage of saline water in tanks. It is known to affect sweet water aquifers in the coastal zones, since the tanks are located in the sandy zones and no measures are undertaken to prevent infiltration. Since aquaculture takes place over large areas, coastal aquifers are likely to be impacted in the future.

Groundwater extraction in the coastal zones is generally undertaken to irrigate lands which do not get surface water irrigation. These lands are mostly located at the junction of interior hardrock zones and coastal alluvial zones. The coastal aquifers most probably get some of the recharge from interior zone. Over-tapping this zone is likely to reverse the current position of fresh and seawater interface. This can result in seawater intrusion as already evidenced in Gujarat and other coastal zones in the country.

Fluoride is the major quality problem in the interior areas of the state. The fluoride affected districts are Nalgonda, Anantapur, Cuddapah, Guntur, Nellore, Chittoor and Krishna. In each of these districts, some villages do not have any groundwater source free of fluoride. The state government has commissioned many surface water based water supply schemes, to address this problem. In some of the affected areas, water treatment through the Nalgonda process has been attempted but these plants are reported to be mostly defunct now due to

poor O&M. Activated alumina based household and village level treatment methods are being tried out now in the state. The Sathya Sai Trust has set up large surface water based piped water scheme for Anantapur district. The O&M of this system is large and the maintenance of the piped system running across the semiarid country side will not be sustainable. Inland salinity is also reported from the semi-arid regions, especially in the Rayalaseema region, but the problem is not very severe.

In respect of water supply, of the 69,732 rural habitations in the state, there are about 32,000 fully covered (FC) villages and 26,976 (39 percent) habitations are partially covered (PC). Fluoride problems are reported from 12,068 habitations and 8,519 habitations have problems of salinity or brackishness. Of the quality affected habitations, about 46 percent have been provided safe sources subsequently. This leaves more than fifty percent of the habitations needing to be provided with safe drinking water.

III. INSTITUTIONAL CONTEXT

In AP, the delivery model for water supply and sanitation is characterised by (a) a supply - side approach based on planning norms (population, distance and per capita requirement), source reliability and population projections for the next twenty years; (b) low or absent community contribution towards the capital cost of provision of services in rural areas; (c) negligible contribution to capital cost in urban areas; (d) user charges being inadequate to cover operations and maintenance; and (e) ad-hoc and inadequate emphasis on environmental sanitation.

The Panchayati Raj Engineering Department (PRED) is the engineering and works arm of Department of Panchayat Raj & Rural Development. There are two divisions within the organisation, one to handle works on roads and buildings and the other, dealing with water supply. In terms of mandate, the PRED is one of the larger and more influential institutions in the state, [and it caters] to about 70 percent of the population. The PRED continues to share the responsibility of both, the installation as well as O&M of water supply services. Even though devolution of powers following the 73rd CA may mean that the PRED engineers at the district level (responsible for water supply) are now officially under the administrative control of the Chief Executive Officer of Zilla Parishad, their linkages with the line organisation continue to remain stronger as career advancement, transfers and postings, and other cadre management is managed therein.

The organizational structure of the PRED has the Engineer-In-Chief at the head and the Chief Engineers for RWS, Roads & Buildings (R&B), Works and Employment schemes, Vigilance and HRD under the E-I-C. The span is organized into zones headed by a Superintending Engineer, with Executive Engineers in charge at the District level assisted by Deputy Engineers and Assistant Engineers at sub-district levels. While the Assistant Engineer and Deputy Engineer have to work with administrative coordination from the Mandal Parishad Development Officer, the Executive Engineers are required to report on development matters to the CEO, Zilla Parishad. The R&B division is responsible for Panchayat, Mandal and District roads and the construction of public buildings for the ZP, MPP and the GP. The Works and Employment schemes division takes up public works for the ZP, MPP and GPs, which are in the nature of asset creation activities as part of other development programmes

being managed by the district administration. The RWS accounts for about 60 percent of the technical staff in the PRED. The administrative staff make up about 50 percent of the PRED staff.

The PRED -RWS is a specialist technical department created to facilitate asset creation by the rural local bodies. It however also carries out O&M and Quality Control functions, as most of the panchayats do not have the capacity to carry out these functions. Staffing in this department is heavily engineering dominated. The department has been receiving budget sanctions based on works to be taken up and estimated O&M activities. Hence, the physical targets of completion of schemes are emphasized rather than aspects like service delivery, quality and reliability of services. Thus, works and construction wield significant importance as compared to the other functions.

In rural areas, the accent in recent years (because of drying up of sources and emerging quality problems) has been on designing and implementing large comprehensive water supply schemes, with no consultation or contribution from local communities. The O&M costs for these schemes prove to be higher than what Gram Panchayats (GP) and Zilla Parishads (ZP) are willing or capable of bearing, despite the directives issued last year devolving more funds to the local bodies and directing local bodies to collect user charges. In practice, the handover of water supply schemes executed by the PRED to the local bodies has not happened, and the PRED maintains a mobile team for O&M. In recent history, a philanthropic initiative (Sathya Sai Trust) in providing drinking water supply to rural areas in Anantapur by means of a large, relatively sophisticated system, was not taken over by even the PRED because of lack of financial resources for maintenance.

The Department of Municipal Engineering & Public Health (ME&PH) plays an important role in asset creation and as a contractor for water supply and sanitation projects in all urban areas of the state (except notified industrial areas and areas in and around Hyderabad served by the HMWSSB). The functions of ME&PH are similar to that of PRED and consist of carrying out surveys and investigations, planning and designing, contracting and construction supervision and quality control. After completion, the assets are handed over to the concerned local urban bodies for O&M. The ME&PH had an annual budget of Rs. 50 million till two years ago.

The local urban bodies request for a water supply scheme through a council resolution as part of the procedure. The technical designs for the water supply scheme is prepared by ME&PH, which is accorded approval by the MA&UD. Financial resources for these schemes are made available by the state government as loans to the ULBs through internal resources or commercial borrowings.

Initiatives in the urban water supply sector in the state in the past two years, have ensured rapid completion of existing schemes in about 40 urban locations, with loans at commercial rates from financial institutions. However, the borrowings and non-commensurate cost recovery have resulted in financial liabilities for the urban bodies of the order of about Rs. 700 million. Also, some of the schemes have relied on distant sources and annual estimated operation and maintenance costs deter the local bodies from assuming charge of water supply.

Urban water supply throughout the state, except parts of Hyderabad, Vishakhapatnam and Guntur, is not metered. Recently, about 40 urban water supply schemes have been completed through financial assistance of HUDCO. Thirty nine water supply schemes are planned to be taken up through further assistance of HUDCO. HUDCO loan is available at 16.5 percent interest rate, which is perceived to be quite high and GoAP is trying to convert these loans to ones with lower interest burdens, with the assistance of multi-lateral funding organisations. These loans are made available to the Municipalities at an interest of 15 percent, a one year moratorium and repayable over 15 years.

The lack of recovery of any form of user charges is a strain on the local urban bodies and the ULBs find it difficult to meet the total O&M and Quality Control costs. Some of the local urban bodies are reported to be defaulting on the electricity payments. In the municipal towns of the state, while provision for drinking water has been made, deficiency³ is remains very high, as presented in Table (3).

TABLE (3): DEFICIENCY IN WATER SUPPLY PROVISION IN MUNICIPALITIES OF ANDHRA PRADESH, 1999

EXTENT OF DEFICIENCY	TOTAL MUNICIPALITIES
75 - 100 %	11 (4)
50 - 75 %	14 (7)
25 - 50 %	42 (30)
Less than 25%	33 (26)
No Deficiency	15 (48)

Source: Note on Status of Water Supply and Sewerage Schemes, DoMA&UD

Note: Figure in brackets indicate the number of municipalities after completion of Phase-I and II schemes undertaken with HUDCO loan.

The contribution to capital costs or recovery of O&M charges are reported to be higher for most of the comprehensive protected water supply schemes initiated recently. The design and expenses of schemes recently completed indicate an expenditure structure where recovery of O&M charges would be unrealistic. This problem is likely to be aggravated in urban centres where the recent water supply initiatives are mostly large and partly funded with loans borrowed at commercial rates.

IV. LEGISLATIVE AND POLICY ENVIRONMENT

The legal framework for the water supply and environmental sanitation sector is provided by: (a) Acts that relate to state and district level organisations which have a role in providing water supply and sanitation services, (b) An Act that seeks to control groundwater extraction and (c) An Act that aims at advancing public health in the state. The key legislations include:

³ Deficiency in water supply provision indicates the deficiency of supply with respect to ideal provision of drinking water for the population based on norms.

- a. The Andhra Pradesh Panchayat Raj Act 1994.
- b. The Andhra Pradesh Municipality Act, 1994
- c. The Hyderabad Metropolitan Water Supply and Sewerage Act, 1989.
- d. The Andhra Pradesh Groundwater (Regulation for Drinking Water Purposes) Act, 1996.
- e. The Andhra Pradesh (Andhra Area) Public Health Act, 1939.

These legislation are briefly described below:

a. The Andhra Pradesh Panchayat Raj Act, 1994

The Andhra Pradesh Panchayat Raj Act was enacted in 1994, to ratify the Constitutional (Seventy third Amendment) Act, repealing earlier laws on the subject, and providing for the constitution of Gram Panchayats, Mandal Parishads and Zilla Parishads; and related matters. According to the Act, there will be an elected member (Gram Panchayat Technical Committee member) for every 300 persons within the revenue village and the Sarpanch (Headman) will be elected directly by voters in the village.

The second tier, the Mandal Praja Parishad (MPP) consists of the directly elected members (Mandal Parishad Technical Committee member), the Member of the State Legislative Assembly (MLA) representing the concerned Mandal and the Member of the National Parliament (MP) from this area, who is an ex-officio member (they have to opt for one Mandal within their constituency) and sarpanchs (Headmen) of the GP in the Mandal, who are permanent invitees but with no voting rights. The Act also provides for one elected member belonging to minorities based on religion or language. The president of the MPP is directly elected by the registered voters in the area, while the vice-president is elected by the members of the MPP. The Mandal Parishad Development Officer, a government employee, is the Chief Executive Officer of the MPP. The MPP has the power to borrow funds and levy taxes, fees, etc. Its function range from the execution of all programmes under community development to the implementation of welfare schemes.

The Zilla Praja Parishad (ZPP) consists of the elected territorial constituency members (ZPTC), MLAs representing rural areas of the district, the MP of the district and one member belonging to the minorities. The Chairperson of the ZPP is directly elected by the voters in the district, while the vice-chairperson is elected by the ZPP members. The MPP Presidents are permanent invitees with no voting rights. The District Development Officer is the Chief Executive Officer of the MPP. The ZPP has the power to examine and approve budgets of MPPs, allocate funds to MPPs, co-ordinate and consolidate the Mandal level plans into district rural plans and supervise the activities of Mandals in the districts. The Act provides for reservation of 50 percent of elected political positions for SC (15 percent), ST (6 percent), Backward Classes (20 percent) and women (9 percent) in both the MPPs and ZPPs. The Act also empowers the government to constitute Planning and Development Boards at district level, which are expected to formulate and execute annual district plans. An innovative feature of the Act is the disqualification of persons having more than two children from standing for elections.

The Andhra Pradesh Panchayat Act provides for a list of eleven functions which the local bodies are obliged to undertake - construction, repair and maintenance of buildings, roads, bridges, culverts etc., lighting of roads and public places, construction of drains, disposal of

drainage, cleaning of streets and removal of rubbish, etc. The Act also listed 29 functions which the Panchayats may undertake depending on convenience and availability of funds. This include welfare and development functions like drinking water, housing, health and sanitation and water management. Even though the transfer of responsibility for O&M has been authorised by the state government, this has not been effected due to apprehensions of financial burden on the local bodies.

Though the Act came into force in 1994, the rules were not issued by the government, regarding the procedure to levy new taxes and to that extent, the Panchayats are deprived of income. The recommendations of the First State Finance Commission, which submitted its report in 1998, included several non-financial subjects relating to computerisation, administration, staffing pattern for GP, all for strengthening the PRI infrastructure and some legal recommendations. Some of the recommendations on increasing incomes of the local bodies and advocating more scientific methodology for assessment would have an indirect impact on the WES sector, the pertinent directives relating to water supply and sanitation sector were:

- Gram Panchayats should compulsorily levy the water tax under Section 71 of the A.P.P.R. Act to augment the funds for maintenance of the existing bore-wells and other rural water supply schemes (para 9-5-3); and
- Special taxes could be levied on structure with more than 500 Sq. Ft., plinth area if a proposal is received from the Gram Panchayats (Para 9.5.3.).

The State Finance Commission (SFC) had also recommended a higher proportion (39 per cent) of state tax and non-tax revenues to be devolved to the local bodies. However, the government has set-up a second SFC to work out the final formula for distribution of funds. The Second SFC is currently undertaking a detailed study of revenue generation by the PRIs and evolve evolving an appropriate formula for devolution of funds. Their report due in 2000 is reported to be delayed to 2001.

A committee headed by Dilip Singh Bhuria was appointed to examine the provisions of the 73rd CA and recommend a system of Panchayats Raj suitable to the scheduled areas in the country. The committee recommended an alternative system built on the foundation of traditional institutions. Since different ethnic groups live in exclusive and widely dispersed settlements in tribal areas, the constitution and composition of GP would have to be necessarily different to enable face to face and participatory planning.

The Provisions of the Panchayat (Extension to Scheduled Areas) Act, 1996 extended the provisions of Panchayats to the Schedule V Areas and enjoined the states to pass appropriate legislation for this extension, keeping consonance with the customary law, social and religious practices and traditional management practices of community resources. The state governments were also enjoined to entrust to Panchayats, the responsibilities of planning and managing minor water bodies⁴.

⁴ Andhra Pradesh entrusted the *planning and management* responsibilities to different tiers within the 3-tier PRI structure. However the powers and function (lease out minor water body for specified purpose, regulate use of water from rivers, streams and minor water bodies for irrigation purposes), were kept vague (in such manner as may be prescribed).

b. The Andhra Pradesh Municipality Act, 1965 (Subsequently amended in 1994, 1997)

The Andhra Pradesh Municipalities Act was enacted to prescribe the constitution, powers and duties of Municipal bodies in the state. The Act details the responsibilities of the civic administrative body and also prescribes the powers to enforce, within the context of health and security of its citizens.

The Municipal council is empowered, with the sanction of the government, to direct the construction of such works for supplying it with water and may provide for structures of storage and distribution. The Council is empowered to control the use of all water connections provided by it and is liable to supply only as much water as funds permit. The council is empowered to give connections to households, on receipt of applications; provide for classification of water supply under different categories and levy and collect pipeline service charges from every house owner who has been provided a water connection. Most of the Municipalities except Municipal Corporations of Hyderabad and Vishakhapatnam and Guntur, do not have metered connections. Hence, water tax in urban areas of the state, is collected on flat rate and not based on use.

The Municipal Councils are empowered, with the permission of the government, to raise funds through bonds and other accepted market options. However, this option has not been exercised by any urban body in the state, so far. After the Constitutional (Seventy Fourth Amendment) Act, the state government issued the necessary rules, incorporating the following as enacted by the 74th amendment:

- a. Criteria for the gradation of Nagar Panchayats (for transitional areas and small urban areas) and Municipalities;
- b. Reservation of one third of the seats in the Municipality for women, and proportionate representation (in proportion to the share of section of population in the Municipality) for SC, ST and BC communities.
- c. Provision for co-option of members having special knowledge into the municipal administration as also members from amongst the minorities;
- d. Constitution, composition and reservation, powers of Ward Committees (WC).
- e. Fixation of strength of Nagar Panchayats and Municipalities;
- f. Transfer of responsibilities according to the Twelfth Schedule to urban local bodies.

The Twelfth Schedule includes water supply for domestic, commercial and industrial uses; public health, sanitation, conservancy and solid waste management; urban poverty alleviation; public amenities including public conveniences; and safeguarding the interest of the weaker sections of society.

While the 74th CA dictated the constitution of fora for planning at the district level and separate planning bodies for metropolitan areas, this has not been adopted by the state. The GoAP accepted and implemented 13 recommendations of the SFC pertaining to urban local

bodies, which included enhanced allocation for water supply schemes in municipal areas and empowering local bodies to enhance user charges. Following this, there have been enhancements in the connection fee (referred to as donation amount) and revisions in water tariff (read as fixed monthly charges).

In 1997, vide Government Order No. 158, the Connection (Donation) amount was enhanced by 50 percent in Warangal, Kurnool, Guntur, Rajahmundry and Vijayawada Municipal Corporation/Municipalities, and the monthly water charges for household connections increased to Rs. 100 from the existing rate of Rs. 40. All the other Municipalities were ordered to increase existing tariffs by 50 percent.

c. Hyderabad Water Supply and Sewerage Act, 1989

The Hyderabad Water Supply and Sewerage Act (HWSS) was enacted in 1989 to make provision for water supply, sewerage and sewage treatment in the Hyderabad metropolitan area and establish the institutional framework for this. This Act details the constitution, composition and duties of the HMWSS Board. The Act legislates the necessary powers to manage water supply and sewerage within the metropolitan area defined by the government. It also empowers the board to carry out necessary action towards the management of water supply and sewerage in the area. It also empowers the Board to regulate drinking water with prior approval of the Government. The Board is provided with necessary powers to regulate and act on private parties in cases where their actions are seen as detrimental to the purposes of the Board.

The Board is empowered to levy rates, fees, tariffs, rentals, deposits, contributions and other charges in order to provide sufficient revenues to cover operating expenses, taxes, interest payments and to provide for adequate maintenance and depreciation. The Board is empowered to borrow any sum required, with the permission of the government, for purposes of fulfilling its functions under law.

d. The Andhra Pradesh Groundwater (Regulation for Drinking Water Purposes) Act, 1996

This legislation has been enacted to regulate the exploitation of ground water for the protection of public drinking water sources. This law explicitly denies permission to any person to sink any well within a distance of 200 meters of a manually driven public drinking water source or within 250 meters of a power driven public drinking water source. Any person seeking to sink a well within 500 meters of a public drinking water source has to obtain permission from the Technical Officer (a geologist of the State Ground Water Board not below rank of Asst. Hydrogeologist/Asst. Geophysicist) and pay a fee as may be prescribed.

The Act empowers the Revenue officer (not below rank of Mandal Revenue Officer), on advice from the geologist to declare an area as "water-scarce" for a certain period. The extraction of water from wells in the water-scarce area, within a kilometer of the drinking water source, for any purposes other than drinking, can be restricted or prohibited. However, the geologist has to support this decision with rainfall data analysis and regular observations of water-level fluctuations. The law also empowers revenue authorities to enter the land of the well-owner to carry out any investigations, effect closure or disconnection, if

contravention of rules are observed. There is scope for payment of compensation in case of closure or disconnection.

There has been a proposal to amend the act as follows:

- a. The distance norm is changed to uniform 250 m for manual or power driven source.
- b. The Technical Officer may be of equivalent rank in the PRED, APIDB or the SGWB.
- c. Registration of existing wells and new wells is to be made mandatory.
- d. Database in format prescribed by the SGWB to be maintained by the PRI.

The proposed amendment is reported to be part of a more comprehensive Act, currently under discussion with the state cabinet. Punitive measures are recommended and the management and implementation is to be with the PRI, supported by department officials. However, reconciliation of immediate demands from agriculture, sustainability issues and drinking water priorities will be a problem area. While the resource management issues are being addressed through vigilance and law and the responsibility of management vested with the PRIs; there has been no reported plan to empower this institution with information about the resource situation which could enable discussion on options and empowered choices. Agriculture, a major consumer of ground water will continue to be driven by crop choice based on economic returns, labour situation and food consumption preferences and it might prove difficult to regulate inputs into this without addressing the above issues. The existing differentials between cost of irrigation in canal-irrigated areas and groundwater irrigated areas and regulation being sought for the latter will also bring back the question of regional imbalances in development. There is also the issue of co-ordination between the agencies – Electricity Distribution Companies, Groundwater Department and local administration – who have powers of regulating groundwater use directly or indirectly. The campaign to regularise electricity connections in July 2000, saw some of the larger increments in irrigation pumpset connections happening in the drier districts of Mahbubnagar, Anantapur and Nalgonda.

e. The Andhra Pradesh Public Health Act, 1939

The Andhra Pradesh Public Health Act, 1939 provides for the advancement of the public health of the Andhra area of the state. It advises the local authority on the appointment of a health officer. The Act details the powers of the Public Health officer in directing the local authority with regard to improvements in water supply, maintenance of public drains, provision of sanitary conveniences and abatement of nuisance.

The Health Officer is also empowered to prohibit use of water from suspected sources in case of infectious diseases; take action on trade, which is felt to be affecting communicable diseases and advise necessary action in the case of insanitary buildings, unsound food, over crowding and arrangements for fairs and festivals.

f. Other Related Legislation

Water Rights

As in the rest of the country, individual rights over surface water are unclear resulting in riparian rights being exercised more by persons abutting the water course. The lack of any defined modality of water rights or licences for water have perpetuated characteristic head-

end to tail-end differentials even in irrigation projects and benefits have been more to certain persons by virtue of the location of their land. Individual rights for ground water resources were recognised only through land rights and this bestows an undue advantage to those who have economic power, farm size and access to technology. The unrestricted access to groundwater, even at the cost of depriving earlier uses, does not have any mechanism to compensate the user who loses his original share of water due to heavier extraction by the new party. The rules and norms developed by groundwater boards, nationalised banks and state electricity boards, specifying overdraft zones and safe distance factors, have been found difficult to enforce and monitor. Also, the effectiveness and use of such norms in hard rock aquifers needs a critical examination.

Irrigation

In Andhra Pradesh, state legislation relating to the irrigation sector - The Andhra Pradesh Water Tax Act, 1988 and The Andhra Pradesh Water Tax Rules, 1990; and The Andhra Pradesh Farmers' Management of Irrigation Systems Act and Rules, 1997 - impact the water supply sector, when viewed from the vantage of comprehensive water resource management. The Andhra Pradesh Farmers' Management of Irrigation Systems Act and Rules, 1997 has enabled the mechanism of water distribution management, maintenance and rehabilitation of surface irrigation canals/drains to be carried out through local Water Users Associations (WUA), which were formed by law and elected. This initiative of the state government, backed with initiatives to train elected members on administration and financial management, is aimed at improving the management of irrigation in the command areas and irrigation efficiency by speedy rehabilitation of canal systems. During this period, the state government has also been able to increase irrigation charges and thus partially reduce state subsidies.

Power

The power distribution in Andhra Pradesh is carried out by a Public sector entity, the Andhra Pradesh State Electricity Board (APSEB), which has been restructured into generation, transmission and distribution companies as a part of the World Bank assisted Power sector reforms project. The impetus provided for agriculture in the earlier plans influenced the power tariff policy. The tariff for power for agriculture pumpsets was based on a flat tariff from 1984. The tariff revision in 1996 and in 2000 retained the flat fee structure, but increased the annual payment depending on the power of the pump set. Also, a concession on this flat fee (between 33 to 12.5 percent) was offered for farmers in the Drought Prone Area Program (DPAP) districts. The reforms in the power sector initiated by the state government and aided by multilateral and bilateral agencies, legislated the Andhra Pradesh Electricity Reform Act, 1998 and Rules, 1999. The agenda for reforms propose a ten year phased plan to move towards real cost pricing, while improving access and quality of service. In the tariff ruling for 2000-2001, the Andhra Pradesh Electricity Regulatory Commission has asked the utility to carry out a full census of agricultural connections before the next tariff filing, and to prepare a plan of action towards achieving the metering of all agriculture connections over the next three years.

Protection of Special Interests

Some of the important central acts which protect and safeguard the interest of the tribals are (a) Protection of Civil Rights Act, 1925 (b) Scheduled Caste and Scheduled Tribes (Prevention of Atrocities) Act, 1989 (c) Bonded Labour System (Abolition) Act, 1976 (d) Child labour (Prohibition and Regulation) Act, 1986 and (e) Forest Conservation Act, 1980. In Andhra Pradesh, several regulations have been made in tribal areas for protecting the tribal communities' interests over land, against exploitation by moneylenders and for debt relief. The state government is in the process of seeking appropriate amendments to the laws vesting rights over land with the tribals in the Scheduled Areas. This is to facilitate the opening up and development of the mineral industry, in line with the goals expounded in the Vision 2020.

State Development Policy and Focus on the Water and Sanitation Sectors

The policy of the state towards the development, management and use of water resources in the state can be placed in context from the sectoral allocation in plan expenditure over the years. Table (4) provides an overview of the sectoral allocations in the water sector in the Second and Eighth Five Year Plans, as against the total allocation (up to the end of the Eighth Plan).

SECTOR	SECOND PLAN (1956-1961)	EIGHTH PLAN (1992-1997)
Agriculture	16%	7%
Irrigation	35%	15%
Power	20%	57%
Industry & Mining	5%	2%
Transport & Communication	5%	7%
Social services	19%	12%
Urban Water Supply	1%	1%
Rural Water Supply	1%	2.1%
Miscellaneous	0%	0%
Total (Rs. Million)	1,886	232,722
Total allocation for water supply up to the Ninth Plan (Rs. Million)		13,961
Share of Water Supply in Total Plan Allocations up to the Ninth Plan		3.4%

Source: Plan Documents, GoAP, Hanumantha Rao et al, 1998

Andhra Pradesh does not have a codified Policy for Drinking Water Supply and Sanitation, while the Government has recently released an Irrigation Sector policy (1995), as part of the reforms programme in public irrigation management. An examination of objectives, strategies and approaches followed by the state in the planning process over the decades and the key legislation examined assist in charting the contours of public policy thinking relating to water in the state.

Across the Five Year Plans, the two sectors that have received special attention are irrigation and power. While the irrigation sector has consistently received more than 25 percent of the outlay, the power sector has received at least 15 percent. Resource allocation for social services has always been above 10 percent and for industries and mining, it has been 5 percent (or less) of the total outlay.

Water Policy

The approach to water resources in Andhra Pradesh plans has evolved continuously in response to emerging needs and demands. In the early decades of planning in the state after independence, water was viewed as a resource that had to be harnessed for agricultural development. Intense focus on water as an agricultural input gradually gave way to a broader perspective during the International Drinking Water Decade (1981-90) which helped to highlight the importance of drinking water in development. Increased spending on water supply from the Sixth Plan onwards reflects this change in outlook. In a similar vein, the Seventh Plan of the state stressed the need for a harmonious balance between economic development and social development. The human development paradigm of the 1990s, incorporating concerns of environmental sustainability, has reinforced the idea that water resource development involves a holistic people centred approach to managing natural resources. This is reflected in the Eighth and Ninth Plans of the State that address water management, water conservation, less water-intensive cultivation, and replenishment of water sources. Thus, over the decades, attempts to exploit water have given way to managing water resources for sustainable growth with human development.

The Ninth Plan (1997-2002), while discussing agriculture, called for efficient water management. Modernisation of old irrigation projects to ensure water conservation reliability, and creation of Water Users' Associations to maintain the distribution system formed as a part of the proposed strategy. In respect of drinking water, the Plan aimed at full coverage of 14,677 partially covered, 7,874 fluoride affected, and 2,695 brackish habitations. A separate Rural Water Supply Board was envisaged to advise on rationalisation of user charges. Other elements relating to water supply were identification of the need for a policy of reservation of water in reservoirs for industries, commercial establishments and for domestic consumption, and the idea that urban bodies would have to plan for economic recovery of investment, by collecting user charges and through access to institutional finance.

The Irrigation sector policy prepared by the state government has enunciated the improvement of irrigation efficiency through participatory management of the distribution infrastructure. It also highlights the need to increase cost recovery and provide more user responsive irrigation. The sector strategy also enunciates the need for a Comprehensive Water Resource strategy accounting for domestic, agricultural and industrial uses based on river basin planning. However, steps towards this would be taken only after reforms on distribution management and public expenditure correction achieve a certain degree of stabilisation. Also, the data needs for the policy and plan envisaged are highly biased towards the surface water resources component.

The State Water Conservation Mission (SWCM) was constituted in May, 2000 with the objective of developing a vision and strategy for water conservation and sustainable utilization at the state level. The Mission seeks to achieve this through a time-bound action plan and convergence of departmental plans and programmes at the district and sub-district

The changing attitude towards water have however not resolved the competition between water as a resource for agriculture, and water as a resource for drinking purposes. Expansion and development of the agricultural sector incentives provided for irrigation development and subsidies on power, have increased the demand for groundwater based irrigation, leading to depletion of groundwater resources. Since by virtue of the natural resource regime, irrigation development has created and accentuated regional imbalances, the state has had to provide succour in the non-irrigated tracts by other subsidies (lower power tariff for agriculture in drought-prone areas to enable groundwater development).

The adverse impact on availability of water for drinking purposes notwithstanding, the state continues to accord priority to economic development by means of increased irrigation. With five percent for water supply and sanitation, and 23 per cent for irrigation, the Ninth Plan outlay for Andhra Pradesh does not indicate any major shift from the past. The broad picture of water resource management suggests that the push towards drinking water given by the 1987 National Water Policy, appears to have been offset by the pull of politico-economic factors in the State. A public expenditure strategy based on large allocations to numerous broad-based welfare programmes initiated in the latter part of the 1980s coupled with non-expansion of the revenue base affected the fiscal situation of the state. The reforms initiated in the irrigation sector during the mid-1990s for better management and cost-recovery of the supply system are likely to improve the agriculture production situation and lead to better water resource management. However, the corrections being planned at the input side in these sectors would need to be complemented with corrections at the market end too and the process will need to be carried out in phases with corresponding safety nets.

Policy with Focus on Vulnerable Groups

About Six percent of the allocated funds for rural water supply, are utilised for providing water supply in tribal settlements. The Social Welfare Department provides funds for civic amenities to SC habitations. The Ninth Plan allocation for these community services was Rs.5 million. With a view to promoting general awareness among SCs, the state government finances opening of libraries in SC habitations. Under the Central Sector Plan, Government of India provides financial assistance to new SC assignees of surplus land, to improve irrigation facilities on a community or individual basis. The State government too has a scheme for undertaking land improvements including encouraging SCs to invest in bore wells, energise existing wells and other similar programmes.

There are a number of programmes being carried out in the state for economic empowerment of women, including formation of Self-Help Groups (SHG) and training programmes for income generation. The state government produced an Action Plan for Women's Development (1994), which aims to bring about a gender focus in state programmes through allocation of a third of the funds in each sector to women-oriented programmes. The directives have been formulated, but the modalities of targeting and effectiveness are not clear, since the action plan is more a broad-spectrum prescription rather than issue-based and focused action.

Initiatives in Participatory Governance

The *Janma Bhoomi* programme is a people centered development process launched in the State of Andhra Pradesh in January 1997. This process has evolved out of the experience gained through the implementation of *Prajala Vaddaku Paalana* (taking administration to the door steps of the people) launched in November 1995 and *Sramadanam* (contribution of labour) launched in January, 1996. The *Janma Bhoomi* aims at establishing an ideal society, which embodies and cherishes the principles of people's participation, equality, transparency and accountability, leading to sustained economic development and excellence in all walks of life. The goal is, an enhanced quality of life for every man, woman and child in the state. Ten rounds of Janma Bhoomi have been held in the state up to now. The following are the five core themes of the Janma Bhoomi mobilisation:

- a. Community Works
- b. Primary Education
- c. Primary Health and Family Welfare
- d. Environment Conservation
- e. Responsive Governance

The programme has claimed success in raising people's awareness of planning and implementation issues, and increasing role of the people in planning and implementation. The programme has been able to utilise funds in different sectors effectively and achieve a campaign mode of awareness building. For instance, both state and centrally sponsored programmes allocated funds for IEC at the district level for mobilisation and publicity. However, follow up action and corrections necessary to sustain the campaign and their outcomes, remain to be implemented and are likely to be constrained by availability of resources locally.

Vision 2020

In early 1999, the Andhra Pradesh government unveiled 'Vision 2020' - a document articulating collective goals and aspirations, that the state hopes to realise by the year 2020. The state government has identified 19 growth engines on the basis of the resource availability in the state. In order to attract investments in the above categories, the GoAP, as the vision 2020 document outlines, would be focusing on three broad industry categories:

- | | | | |
|----|------------------|---|--|
| a. | Knowledge based | : | Pharmaceuticals, Information Technology (IT) |
| b. | Resource based | : | Mining and Agro-industries |
| | Mining | : | Cement, Coal |
| | Agro Industry | : | Oil Seeds, Tobacco and Sugar |
| c. | Labour intensive | : | Garments and Leather |

The effort also charted the route towards ensuring sustainable development in the region by the second decade of the 21st Century. Sectoral action plans, in line with the vision, are under preparation by sub-committees constituted for the purpose. Universal access to safe drinking water and sanitation is among the goals outlined in this blueprint for the state's development.

The approach envisioned is to make provision of services demand driven with substantial popular participation. While running of municipal services on a competitive basis, involvement of private sector in developing urban services and infrastructure, and local management and control of local services form part of the urban growth strategy; Harnessing of water resources, stakeholder management of irrigation systems, and integrated development of rainfed areas are expected to stimulate agri-business and contribute to self-reliant rural communities.

Vision 2020 commits the state to ensuring the provision basic services in urban areas and hopes to augment water supply by the tapping of current irrigation sources, judicious exploitation of ground water and utilisation of river water through piped water-supply schemes. With regard to water quality in urban areas, appropriate technologies are proposed. Technical assistance from non-governmental organisations and limited governmental subsidies to support the implementation of alternative technologies in the field of urban water supply and sanitation, are expected.

While the vision document envisages a decentralised empowered polity, judicious use of resources, demand-responsive services and economic growth, the emergent contradictions in the vision are showing themselves. The power sector reforms and current capacities of the utilities have forced the state to request the farmers to control paddy cultivation and opt for less water consuming crops, while increase in rice production was a growth engine in the vision.

Rice cultivation, dairying, poultry, horticulture, fisheries, and agro-industry are among the "growth engines" selected for promotion by the state to revitalise agriculture. All these activities are water demanding and the conflict between irrigation and other sectors need to be resolved in this predominantly semi arid state with ongoing interstate water disputes. A common thread running through the various "growth engines" identified in the agricultural sector is the presence of infrastructure bottlenecks, especially in processing. Agro-processing – whether in dairying, poultry, horticulture or fisheries – involves the use of large quantities of water on a regular basis. In all these sectors, the state is committed to rectifying the bottlenecks.

The industrial growth strategy also contains elements that raise the likelihood of increased use of water for non-drinking purposes. For instance, building a strong position in garment and leather products calls, for continuous power and water supply in the export-processing zones envisaged near Secunderabad and the state's southern border.

Viewed at a broad level, the state's plan for industrial development is likely to result in the rise of townships and industrial clusters. The experience of high investment in the urban centres in other parts of the country (e.g. Tamil Nadu), suggest that the demand for water and sanitation facilities would grow considerably with the spurt in urbanisation. While the mega city project is expected to take care of the growing needs of Hyderabad and Secunderabad, appropriate arrangements will need to be worked out in areas selected for the expanding urban townships in other parts of the State.

Given the state's resource endowment, promotion of agriculture and industry would invariably involve diversion of water resources towards non-drinking purposes. At the same time, it is felt that the direction in which the state is headed and the implications of the proposed strategy, have to be understood well in order to design appropriate projects in the water sector in Andhra Pradesh.

V. EXISTING PROGRAMMES

Rural Water Supply and Sanitation

The Rural Water Supply programme is managed by the PRED throughout the state, except for the TSP areas, where it is responsible only for O&M. Of the 69,732 habitations, Full coverage of 14,677 partially covered, 7,874 fluoride affected, and 2,695 brackish habitations is envisaged by 2002. While the partially covered habitations are to be provided from the MNP funds and the ARWSP funds released by RGNDWM, funds have been sought for the fluoride problem under the RGNDWM sub-mission. A separate Rural Water Supply Board was envisaged in the Ninth Plan to advise on rationalisation of user charges and is yet to be set up.

The quality monitoring systems developed by the PRED, have not proved adequate in systematically monitoring water sources, and are currently being revamped. The initiative supported by the Netherlands Assisted Project in Vizianagaram district in this regard, aims at setting up comprehensive surveillance facilities. While the PRED has set up district laboratories for quality monitoring, the Institute of Preventive Medicine has pioneered steps for mobilisation and awareness building in the case of an outbreak.

The Rural Sanitation Programme is being carried out with CRSP and corresponding MNP funds. The mobilisation for this is being undertaken through the Janma Bhoomi Programme and this process is being managed by the PR&RD department. The IEC Cell in the PRED carries out IEC activities relating to sanitation in the rural areas of four coastal districts of Andhra Pradesh. This project, began in 1997 and is being implemented in the districts of East Godavari, West Godavari, Krishna and Guntur. Until April 1999, the costs of the project were being shared by the central and state governments on a 50:50 basis, after which, following fresh guidelines from the RGNDWM, the project is being fully funded by the Central government.

Urban Water Supply and Sanitation

The Department of Municipal Engineering and Public Health is in charge of planning and implementing water supply and sewerage schemes in urban areas. The completed scheme is handed over to the Urban Local Body (ULB) for O&M. With decreased plan outlays, the UWS programme over the last two years has depended on borrowed funds from financing institutions like the LIC and HUDCO at commercial rates. The initiatives in urban water supply sector have ensured rapid completion of existing schemes in about 40 urban locations, with loans at commercial rates from financial institutions. However, the borrowing and non-commensurate cost recovery have resulted in financial liabilities for the urban bodies, of the order of about Rs. 70 crore. Also, some of the schemes have relied on distant sources and

annual estimated operations and maintenance costs deter the local bodies from assuming charge. As discussed earlier, one major concern is that 10 percent of the ULBs have a service deficiency exceeding 50 percent, and another 41 percent have more than 25 percent deficiency in service provision.

There have been initiatives in rain water harvesting to augment local water resources in two urban centers - Bhonghir and Kama Palle - and these are being currently initiated in Hyderabad. Another interesting approach in urban administration has been the initiatives to out-source and privatise essential functions. The water supply scheme for Vishakhapatnam has been given on a BOO to a private party. The Private contractor provides the water to the Municipal Corporation at its Elevated Reservoirs and the responsibility of distribution and revenue collection etc are handled by the local body. Solid Waste Management including sweeping, garbage collection and removal have been handed over to selected CBOs in 60 of the 116 municipalities. These CBOs formed under the SJSRY programme (annual budget of Rs. 250 million plus Rs. 30 million from the NSDP) into SHGs have been linked with the financial institutions and financing arrangements made. The CBOs, with the municipalities have been able to arrive at user-based administration charges for the SWM, thus devising differential tariffs for different entities like hospitals, markets, etc. The Individual Sanitary Latrine programme which is managed by the parent department (Municipal Administration & Urban development) is also being taken up through these CBOs, in some of the municipalities.

The HMWSSB manages the water supply and sewerage in the twin cities of Hyderabad and Secunderabad. The utility has finished the re-laying and augmentation of existing sewerage infrastructure with the assistance of the World Bank. The proposal for augmenting water supply to the city from Nagarjunasagar (about 140 km) is still pending technical clearance with the CWC and financial clearance from the funding agencies. The current initiative to build the Cyberabad Township adjacent to Hyderabad is likely to further strain the capacities of the organisation.

VI: CHALLENGES TO ACHIEVING INTERNATIONAL DEVELOPMENT TARGETS

1. In this predominantly agricultural state, irrigation will continue to be a priority of the farmers. The current pattern of agriculture demands significant state support from the state in agriculture. Indebtedness, shift to cash crops and vulnerability to drought, especially in the semi-arid regions, preclude any significant farmer-level investments in water conservation. The ensuing conflict between water for irrigation and water for other uses will remain one of the major issues to be resolved in the near and distant future.
2. The supply side paradigm for provision of drinking water is being sought to be changed with enhanced devolution of financial powers to local bodies and enunciation of demand responsive approaches in the state Vision 2020. However, provision of drinking water is still very much supply oriented and administrative actions have been more towards achieving marginal financial corrections and in encouraging private sector/community takeover of certain components. Pilot initiatives like the participatory planning and management project in Vizianagaram, assisted by NAPO,

are few and there has been no concerted move towards decentralisation and local-level planning and management. On the other hand, initiatives like the Sathya Sai Water Supply in Anantapur, and Mahbubnagar districts have raised the aspirations of people and reinforced the idea of drinking water as a free good. Changing this paradigm amongst the population as well as the institutions, will be a major challenge.

3. The responsibilities for operations and maintenance reside with the local administration, but there has been a failure in effecting this, especially in rural areas. The financial burden and mismatch of technology-skill levels are some of the major reasons. The development of a varied technology and management option set suited for local finance and skill availability would probably be the only way forward. It is to be noted that this route would require substantial capacity-building of local institutions in terms of technical and managerial skills.
4. Comprehensive quality monitoring and surveillance in drinking water supply is non-existent. Quality monitoring is done by different agencies whose inputs are often uncoordinated. This would entail development of an appropriate MIS which informs planning and users. Since the state already suffers from water quality problems such as fluoride and salinity, capacities for local level monitoring and corrective measures are urgently required. Development of these capacities in a low formal literacy environment require careful consideration as is reflected in the mixed results from earlier initiatives with household fluoride treatment.
5. In urban areas, the withdrawal of subsidy elements in the cost water and power has started impacting the household budgets, especially amongst poor. The expanding urban areas in semi-arid areas which have no nearby sources would have to bear the increased costs for supplying water. The urban development strategy which has historically concentrated around a few centres in the state would then need a serious re-think.
6. While there is progress on the individual sanitation initiative, there is the need for follow-up and monitoring. Habitation level planning needs to incorporate Environmental Sanitation to enable planned solutions, in line with provision of water supply.
7. Correction in public expenditure and increased privatisation would impact the vulnerable and disadvantaged groups differentially and require adequate security nets need to be thought of. In the current paradigm, where the knowledge-based sector and certain growth industries are to be encouraged, the disadvantaged groups are in danger of slipping further due to inherently lower skill base on one hand and the degrading rural production systems on the other.
8. The state has undertaken the move towards demand responsive strategies and costing for basic services. With hike in charges of power and prices of commodities in the PDS, the political risk would force the government to go slow on any further initiatives towards realising user charges.

9. The Action Plans to realise the vision 2020 are under preparation. The Vision seems to have viewed sectors/opportunities in isolation. The action plan (being prepared departmentally), will see the emergence of inter-sectoral contradictions, which will have to be reconciled, possibly forcing a rethinking of policy and priorities.

Potential Areas For Intervention

1. Andhra Pradesh comprises both water scarce and water surplus regions with varied livelihood patterns. A single norm for water supply fails to capture the needs in different parts and is unable to provide options that can be sustainable in all types of situations. It is necessary to subdivide the state into contiguous zones based on resource endowments, dependency on water for livelihoods, resource use patterns and capacity of local institutions. This zonation will provide a firm basis for design of regional strategies and intervention options for various parts of the state. Outputs from this exercise can be used for influencing the policies on water resource management and WES sector. Without this, the current across-the-board solutions will continue to be applied, with limited success in most regions as evidenced by experiences so far.
2. For the rural water supply systems to be sustainable in semi-arid environments, it is necessary to use ground water sustainably. This would mean adoption of less water intensive cropping patterns and improvement of water use efficiency at farmer level. A key input in this is to improve resource literacy at user levels and effective adoption of ground water resource management at village/watershed levels. The state has already taken up watershed development interventions on a significant scale. Unfortunately, the current watershed development programmes are constrained in providing inputs to building resource literacy and imparting sustainable water resource management skills at user levels in short timeframes. Resource literacy in low literacy environment would mean new paradigms of education and major inputs in this direction. DFIDI may take up pilot projects with IWRM, resource literacy and capacity building of local institutions, as integral parts of water resource management and WES. Capacity building of local level institutions like PRIs and NGOs to assess natural resources and plan for sustainable water resource development and management should be the key goals in these pilot projects. It would be advisable to link this strategy for WES with ongoing livelihood, education and health programmes assisted by DFIDI, in the state.
3. PRED will continue to play a key role in the WES sector for the next few years. While it has engineering capacities, its social development and participatory planning skills are limited. Involvement of other possible institutional role players is limited in this state. Unless Agriculture, Education, Health & family welfare, PRIs, PRRD, Finance, Women & Children, Tribal development and other institutional stake holders are involved, WES goals are unlikely to be achieved in a sustainable manner. Therefore, it is suggested that DFIDI involves these stakeholders in any programme supported by them.
4. Andhra Pradesh has been in the forefront of initiating reforms towards a more demand responsive approach and costing of services. The Water and Trees bill is currently being discussed and may soon be enacted to regulate groundwater resources in the

state. This would assign responsibilities on different stakeholders to maintain assets created by State investment; and aims to ensure management of natural resources in a more comprehensive manner. These efforts call for comprehensive planning and modulation of inter-sectoral interests, if the IDT goals of resource conservation and sustainability are to be achieved. DFIDI could take an active role in the process by continuous dialogue with the state to modulate these efforts to achieve IDT. This would necessitate building a reliable natural resource database and utilising the information available with the government to develop a comprehensive understanding of rural production systems and natural resource use. The strategies derived from zonation of the state based on resources, usage pattern and skill base, can be a first step in this direction.

5. While the state is committed in policy to protect the interests of the poor, the ongoing economic reforms and multi-pronged development strategies being followed by the state are likely to adversely impact the poor and open up new contradictions. DFIDI will need to engage with the situation of the poor and advocate with policy makers, the need to buffer the identified adverse impacts wherever feasible. Additionally, alternate methods for existing production systems would need to be tried out and perfected, to help the vulnerable groups to make use of improved services within their capacities.
6. The Vision 2020 and the goals enunciated thereof bring out contradictions across sectoral interests. There is the need to engage with the state for the development of comprehensive policies, which protect the interests of the poor and are sustainable in terms of resource use.

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
A	Support relevant parts of the government to respond to the transition from supply driven to demand responsive approaches	GoAP has made cautious first steps for Pilot projects in drinking water supply. Vision document for state accepts this principle.	<i>Assist in developing state WES strategy taking account of Vision 2020 and other sectoral pulls.</i>	<i>Work with PR&RD, Planning & Finance, MA & UD, ME & PH; Health, Women & Children; Work with ZP and smaller ULBs in parallel</i>	<i>GoAP will cite inability to move to demand responsive approach across all service sectors in view of tariff corrections already in place. Will have to take phased approach and selected areas only in short-term.</i>
		Predominance of supply-driven approach and achievement of coverage for rural and urban settlements	Develop Local/regional solutions: Work on regionalising norms; select strengthening of local urban and rural bodies in selected representative districts.	Work with Line departments and Planning & Finance; make local/regional norms and solution development consultative.	Centralised state level planning and supply-driven approaches will continue as capacity and orientation does not change in the short-term
		Poverty focus and other vision ideas (growth engines) drive policy and public investment	<i>Engage with and assist in providing focus to multiple dimensions emanating; Focus on WES parameters in each sectoral policy</i>	<i>Work with Planning & Finance, CMO and select district administrations</i>	<i>Poverty alleviation schemes devised on formulae and may not be easy to accommodate changes or linkages therein</i>

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH					
	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
		Local governments are yet to be strengthened and are dependant on the state government	Focus capacity building assistance to local bodies starting with DFID assisted project areas	Leverage links with State Water Conservation Mission, Rural Development, PR & RD, MA & UD and include Planning & Finance in overall process	Devolution to local bodies is far from complete in both rural and urban areas
		State Government has engaged with poverty issues and environmental services; but initiatives have been populist in the former and ad-hoc in the latter.	Use CMO, Finance & Planning to provide policy support, dialogues and monitoring (but not operational links)	Other DFID India to assist in these realms including Public Sector Reform, Energy; Local Body Finance for operational links to policy	Operational/ground level programmes are in danger of becoming dependant on the initiative and dynamism of the CMO creating a bottleneck.
B	Promote policies and approaches that respond effectively and efficiently to community demands for WES services	GoAP follows Gol guidelines as central funding tied to this	Provide support from the national level work	Work with Finance & Planning; PRED, MA & UD to develop sensitivity to basic service issues	Demand responsiveness may not be accepted by State government departments in reality - may have doubts of its efficacy
		Public agencies are removed from community needs and demands - driven by and accountable to schemes available from State and Centre	<i>Exposure, training and orientation; in parallel, promote local level accountability</i>	<i>Initiate district level monitoring with strong social audit component; work also with auditors of state government to incorporate social effectiveness as part of State audits</i>	<i>It may take a long time to develop accountability to local population - mechanisms may get restricted to accounting and audits only</i>

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
		Service provision agencies do not have the flexibility and capacities to respond to community demands	Support alternate scheme structure and content - with participation of other government and non-government agencies; May promote mission type teams to provide initial thrust	PR & RD, MA & UD, Health, Women & Children to have roles apart from PRED and ME & PH - task force for selected districts	Coordination and links may be a problem. Will need to expend time and resources on such disaggregated planning and management efforts.
		Schemes and programmes for hilly tribal areas need to be very different from what is appropriate in coastal areas and the semi-arid areas	Work on regionalising state norms; assist in evolving appropriate ownership rights and strengthening traditional resource management systems in tribal areas	Work with Tribal Welfare Dept, PR & RD, traditional tribal councils and develop packages suitable for these communities to own and manage simple and acceptable WES systems	Subsidisation and works may attract external interests from non-tribal areas and from non-tribals in tribal areas
C	Support well-informed strategic decision making processes for allocating water resources, financing services and involving the private sector	Water Resources Sector Policy is driven by Irrigation needs primarily.	<i>Support Integrated Water Resources Management Policy and Practices - allocation, efficient use and local provision</i>	<i>Work with Irrigation, PR&RD, MA & UD; State Groundwater agencies and link with WFS programmes</i>	<i>Current legal rights over water and differential resource allocation between end-user departments might hinder effective engagement between agencies</i>

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH					
	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
		Irrigation sector pays enhanced user charges and "last mile" management has been decentralised.	Support evolution of policy which brings down the differential cost for irrigation between canal and groundwater irrigated areas.	Work with Finance, Planning, Irrigation, Energy, Agriculture on introducing and sustaining a culture of realistic user charges and community managed contribution funds	Current cropping pattern with high emphasis on Paddy and policy controls on Paddy do not allow much bandwidth for these intra-sectoral negotiations.
		State Irrigation department is moving toward increased participatory management.	<i>Replicate same slowly in drinking water sector; push strongly in urban sector WES services starting with sub-components like SBM, Environmental sanitation</i>	<i>Start dialogue with Finance & Planning, PR & RD, MA & UD, Irrigation, Agriculture, Health and FW to learn and evolve sustainable local management strategies</i>	<i>Poor may be marginalised in terms of access to WES services, especially in mixed communities with resource constraints</i>
		Capacity to manage private sector participation untested except for contracting out of select services. Large investors attracted in mining, Large industries and power sectors. Vision document spells need for private investment in services.	Promote privatisation to link with local employment generation; promote local vendors and contractors	Work with para-statal corporations selectively; dialogue with broad-band forum of private industry in state; engage with local private sector directly; develop local NGO capacity for social and technical work	Para-statals and government may disfavor private involvement; large companies might infringe on protected rights in resource-rich areas

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
D	Support government's role in encouraging civil society involvement	GoAP has been supportive of NGOs, with increased support to CBOs (at the expense of NGOs) recently.	Capitalise on GoAP initiatives and strengthen technical capacity of CSOs.	Work with NGOs, private sector and other CSOs - especially for advocacy	GoAP may be selectively supportive of CSO efforts but not when opposed to current development paradigms (Vision 2020)
		CSOs/NGOs/CBOs do not necessarily have capacities required for WES work	<i>Help strengthen technical and managerial capabilities local CBOs; Provide forum for leveraging supportive capacities of CSOs</i>	<i>Work with different CSO NGO networks (not one or two only); help government set an appropriate frame for CSO involvement</i>	<i>Co-ordination of CSO efforts critical; abdication of state agencies of joint responsibilities possible</i>
E	Work with government to ensure poor people's interests are reflected in legal policy and regulatory framework	GoAP is committed in policy to protect the poor	<i>Strengthen vision, perspectives and knowledge base of State planners and policy makers; sensitise to importance of WES in poverty</i>	<i>Work with and strengthen State Planning Board, Civil Society and Research Networks; Engage with the CMO and Finance & Planning in building information base and monitoring</i>	<i>Poverty focus may continue to be given priority but only in terms of more financial investments; WES may continue to be seen as mere service provision</i>

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH					
	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
		Policy to ground operations do not protect the poor	Strengthen policy, planning and output links in WES sector	Work with PR & RD, Health & FW, MA & UD, Women & Children to highlight the primacy of safe drinking water and Environmental Health in poverty and livelihood improvement. Assist in build-up of monitoring for enhanced Health focus.	Exercise may become academic due to differing foci of institutions
		Centralised Monitoring by state being built up and local accountability mechanisms weak	Assist in enhancing and more decentralised monitoring systems and push for information dissemination to local levels.	Work with PR & RD, Health & FW, MA & UD, Women & Children. Assist selected local rural and urban bodies in decentralised monitoring and push information into public domain with open dialogue.	Resistance from existing centralised systems and technical teams.
		Legal and regulatory framework for poor exists for special classes and areas (e.g. Scheduled Areas Act; National Commission for SC/ST, etc.)	Strengthen implementation and sub-state monitoring arrangements; Use laws to influence norms, service delivery and accountability;	Work with Tribal Welfare Dept, Tribal Development and other special Agencies	Implementation may be weak and restricted to select areas only

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
F	Help governments adopt and implement comprehensive national/state strategies for sustainable development	GoAP does not have a comprehensive vision of sustainable development. The Vision 2020 does not take a sustainability test	<i>Opportunity to develop and produce state of economy, society, environment papers (e.g. HDRs) and promote linking investments to indicators; begin with WES and related sectors in parallel</i>	<i>Work with Finance & Planning, CSOs, State Planning Board; District Offices</i>	<i>This may become a block before which other activities are sensibly initiated</i>
		Significant DFIDI; Multi-lateral; and INGO presence is an opportunity	Coalesce and facilitate all externally agencies links and visions; agree on a basic minimum approach (Bangladesh Model) to WES work	Work with partners: Planning bodies, CMO and CSOs	Partners may not agree to a common strategy or may just become a forum which lowers targets
		GoAP and NGO links with national bodies and agencies are well-established.	Focus on agenda on WES nationally as it devolves on state	Work with national GO; NGO and other donor partners	Donors and partners may continue to increase disbursements without critical analysis and joint partnering

KEY ELEMENTS OF ISSUES AND STRATEGY FOR WES - ANDHRA PRADESH

	Option/theme	Overlaps and Gaps	Elements of Strategy	Institutional Strategy	Key Risks to Address
		<p>Extractive and resource centered projects (as opposed to people-centered) will remain attractive for state to attract investments and appropriate rents</p>	<p>Select and work on WES in quality problem areas; primitive and backward areas; then, select areas in mixed environments.</p>	<p>Work with Select District Administrations, Tribal Welfare; Tribal Development Agencies; NGOs; Health departments - establish WES links with Environmental health and livelihoods</p>	<p>Efforts may require keeping in abeyance the current demand responsive approach to tackle urgent health issues.</p>

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GLOSSARY

ARWSP	Accelerated Rural Water Supply Programme
ARWSP	Accelerated Rural Water Supply Programme
AUWSP	Accelerated Urban Water Supply Programme
BMS	Basic Minimum Services Programme
BYBP	Billion Years Before Present
CMR	Child (Under 5) Mortality Rate
CPCB	Central Pollution Control Board
DFID	Department For International Development
EIUS	Environmental Improvement of Urban Slums
GoI	Government of India
GP	Gram Panchayat
HUDCO	Housing and Urban development Corporation
IDT	International development Targets
ILCS	Integrated Low Cost Sanitation
IMR	Infant Mortality Rate
MA&UD	Municipal Administration and Urban Development
ME&PH	Municipal Engineering and Public Health
NCAER	National Council of Applied Economic Research
NIUA	National Institute of Urban Affairs
PMRY	Prime Minister's Rozgar Yojana
PR&RD	Panchayati Raj and Rural Development
RGNDWM	Rajiv Gandhi National Drinking Water Mission
SC	Scheduled Caste
ST	Scheduled Tribe
TFR	Total Fertility Rate
UA	Urban Agglomeration
UBSP	Urban Basic Services Programme
ULB	Urban Local Body
USD	United States Dollars
WB	World Bank
WPR	Work Participation Rate
ZP	Zilla (District) Panchayat

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