# Infrastructure in Andhra Pradesh : Economic and Social Infrastructure

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: *Economic and Social Infrastructure*

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## Introduction

Andhra Pradesh being fifth largest state in respect of population and fourth largest with respect to geographical areas, its performance in terms of economic growth is modest; but with respect to social and human development it is lagging behind many other states in India (APHDR, 2008). The infrastructure (including transportation, energy, banking, education and health facilities) base which is critical for the social and economic development in the state is found to be one of the lowest (APHDR, 2008; see Anant *et al.,* 1999; CMIE, 2000; also see Pillai 2008). According CMIE infrastructure index for the year 2000, Andhra Pradesh found to be ranked 15$^{th}$ among 21 major states in India (CMIE, 2000). In order to improve and unravel the economic growth and human development potential of the state, the expansion of infrastructure (economic and social) base further is critical (APHDR, 2008). Herein, this paper is to examine the infrastructure base and the need and scope for its expansion in Andhra Pradesh.

### *Infrastructure and Development*

Infrastructure plays a critical role in the development process of any economy. Infrastructure is also critical in facilitating the connectivity of people living in different geographies and movement of goods and services and thereby for both the economic as well as for human development. It is most important for the delivery of public services. It is said that 'infrastructure is the basis for development wherein it is the foundation on which the factors of production interact in order to produce output' (Jimenez, 1994: 1). The critical role of infrastructure in the development process has been emphasised for long time. In the literature of development economics it has been emphasised from Smith to recent endogenous growth models. In J. B. Clark's terminology infrastructure development is seen as 'overhead costs' and for Marshall it is 'supplementary cost' (Pillai, 2008). For Albert Hirschman it is 'social overhead capital' which includes 'those services without which primary, secondary and

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tertiary production activities cannot function' (Hirschman, 1958: 83; Jimenez, 1994:1). Broadly, according Hirschman, such infrastructure includes public services from law and order through education and health to transportation, communications, power and water supply as well the infrastructure related to agriculture such as irrigation and drainage system (Hirschman, 1958: 83; Jimenez, 1994:1). For Hirschman's unbalanced growth strategy of development such infrastructure for the growth capital or industry sector is critical factor.

While recognising the significance of infrastructure in economic development many of studies sought to capture relationship between economic growth (aggregate out or productivity) and infrastructure stock. Many times, these studies have considered the public spending on capital expenditure as an indicator proxy for the infrastructure development. There is a voluminous literature in this respect of relationship between growth and infrastructure (see, for instance World Bank, 1991 & 1994; Canning and Fay, 1993a&b; Chibber, 1988; Antle, 1983; Pillai, 2008; UN-HABITAT, 2011).

In fact the economic infrastructure enhances the productivity of physical capital and land whereas the social infrastructure improves the productivity labour. Initial thinking of economic development, however, emphasised on economic infrastructure (including transportation, communication, power supply, irrigation etc.,) for industrial growth and capital accumulation. Later when the human capital dimension of economic development is brought out, the social infrastructure such as health and education gained equal importance. As strong empirical regularities between educational attainment of populations and productivity of their labour have been observed, expansion of educational infrastructure through investment in education has been emphasised (see Schultz, 1981; Schultz 1988; Becker *et al*., 1990). As a positive effect of health and nutrition on labour productivity is well observed expansion of health infrastructure through investment health is seen as critical for economic development as well as social development (Behrman, 1990). Public health is seen as infrastructure for the human development (IJMR, 2009). Such a social infrastructure is seen as crucial for the human development too (Sen, 1999). The recent endogenous growth theories emphasised on human resources formation which is an outcome of social infrastructure (see Romer, 1986&1990; Lucas, 1988).

In this context, to reiterate the objective of the paper mentioned in the beginning, the present paper examines the growth in infrastructure base and the need and scope for its expansion in Andhra Pradesh. The main paper is organised is two sections wherein while section I presents

the analysis of economic infrastructure in the states and the section II for the social infrastructure. The summary and concluding remarks follows in the final section.

## I Economic Infrastructure

Economic infrastructure expands the size of the market and economic activities and thereby employment opportunities. The economic infrastructure that includes all those services such as power, irrigation, transport telecommunication banking and they are directly concerned with the needs of such production sectors as agriculture, industry & trade.

### *1.1 Physical Connectivity*

Physical connectivity between people living in different geographical locations within the state through different modes (road, rail, air and navigation) would expand the size of the market and economic activities and thereby employment opportunities and the mobility of the people. The connectivity facilitates information sharing and thus creates opportunities to improve the capabilities of people.

**Table 1.1: Density of Population in AP and India**

| Sno | Parameter/indicator | Year | AP | India | % of AP |
|---|---|---|---|---|---|
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** |
| 1 | Geographical Area (GA – Sq Kms) | 2011 | 275045 | 3287240 | 8.4 |
| 2 | % of Forest Area | 2001 | 15.0% | 21.02% | |
| 3 | Total Population | 2011 | 84.7 M | 1210.2 M | 7.0 |
| 4 | Density of Population | 2011 | 308 | 382 | |

**Note**: % of AP is to India; M - Millions.

**Source**: Census of India.

The total geographical area of the state is 2,75,000 Sq. Kms. ( or 2,76,00,000 hectares) and there are 28 thousand revenue villages (of which 26.6 thousands are inhabited ones) and 210 towns/cities within the geographical boundary of the state. Again, most of the revenue villages are having at least one or more number of hamlets in its fold. Therefore the total number of habitations including revenue villages and their hamlets/habitations in the state are 66528. It means, each revenue village, on an average, has 2.5 hamlet/habitations. These habitations are spread over the geographical area of the state. For each 100 Sq Km of geographical area of the state, average number of habitations spread over is 24. On the other hand each habitation, on an average, is having 413 hectares of geographical area. Given the geographical distance between different villages, in the absence of any kind of physical

infrastructure facilitating the connectivity across villages, the people living in these villages would be isolated.

Therefore, the connectivity of the people living in different places/geographies/villages within the state and connectivity of the people living in the state with those people living outside the state including neighbouring states as well as those in the distant places/geographies/states/countries is important in the development process.

*1.1a Road Connectivity*

The total length of road in Andhra Pradesh for the year 1956-57 was 17086 Kms (consisting of 338 Kms of cement concrete, 5016 Kms of Blacktop, 10939 Kms of metalled and 793 Kms of unmetalled roads). It (the total length of the roads) has been increased to 198365 Kms by the year 2009-10, a phenomenal increase of 1100 percent (or 11 times increase) over the base, during the last five decadal periods between 1956-57 and 2009-10 (see Table 1.2). Of the total length of road available in the state 45% is laid with blacktop or asphalt, 15% is metalled, 38% is unmetalled and just 2% is of cement and concrete one.

**Table 1.2: Road Length (Kms) in Andhra Pradesh by the Type**

| Year | Cement Concrete | Blacktop or Asphalt | Metalled (W.B.M.) | Un-Metalled (Murram) | Total Length of Roads |
|---|---|---|---|---|---|
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** |
| 1956-57 | 338 | 5016 | 10939 | 793 | 17086 |
| 1999-2000 | 338 | 54876 | 46247 | 63956 | 165417 |
| 2004-05 | 1967 | 73908 | 39309 | 71851 | 187035 |
| 2009-10 | 3663 | 89254 | 29537 | 75911 | 198365 |

**Note**: 1. Road length is in Kms. ; 2. Including National highways, PWD (R&B) and Panchayati raj roads; 3. Reference date as on 31st March.

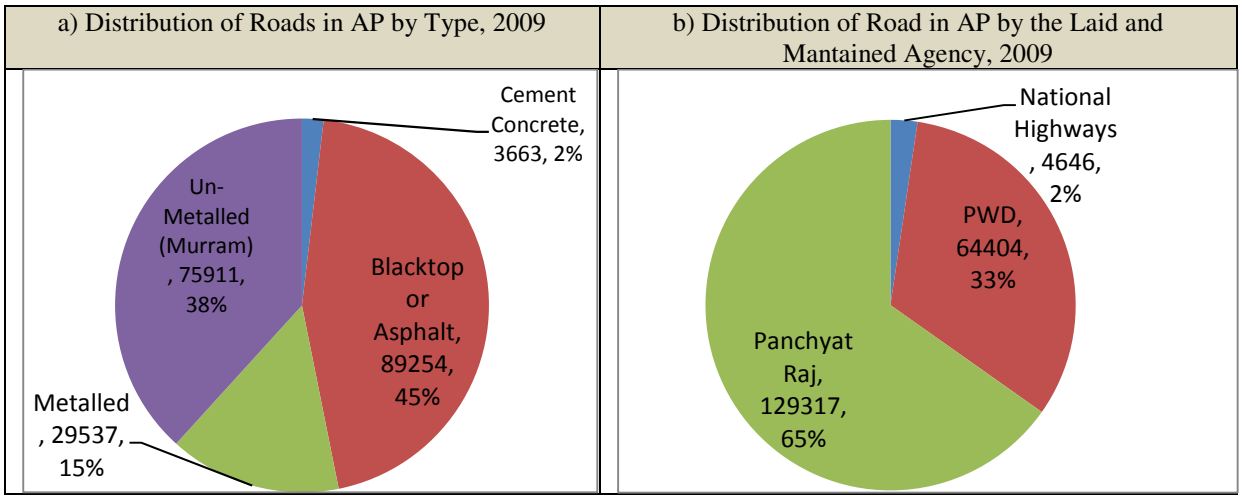
**Source**: 1. DES (2009); 2. Engineer-in-Chief (R&B), Admn. & NH, Roads and Buildings Department, Andhra Pradesh; 3. Chief Engineer (PR), RIAD, Andhra Pradesh.

Although state is having only 4646 km distance (just 2% of its total road length) national highways passes through the state (Figure 1.1), it is important as they connect the state with its neighbouring states as well as the rest of the states in India. The state is having advantage of 5 national highways covering 4646 km distance in the state and connecting the other major cities of India such as Bangalore, Chennai, Mumbai and Kolkata.

The total length of road network available in the state is standardised in terms of its catchment and coverage, it is 6.21 Kms per 100 Sq. Kms of the States' geographical area and 0.55 Kms per 1000 population in 1956-57 and now the length of road comes to about 65.45 Kms per 100 sq kms of geographical area and 2.36 kms per 1000 population in 2009-10.

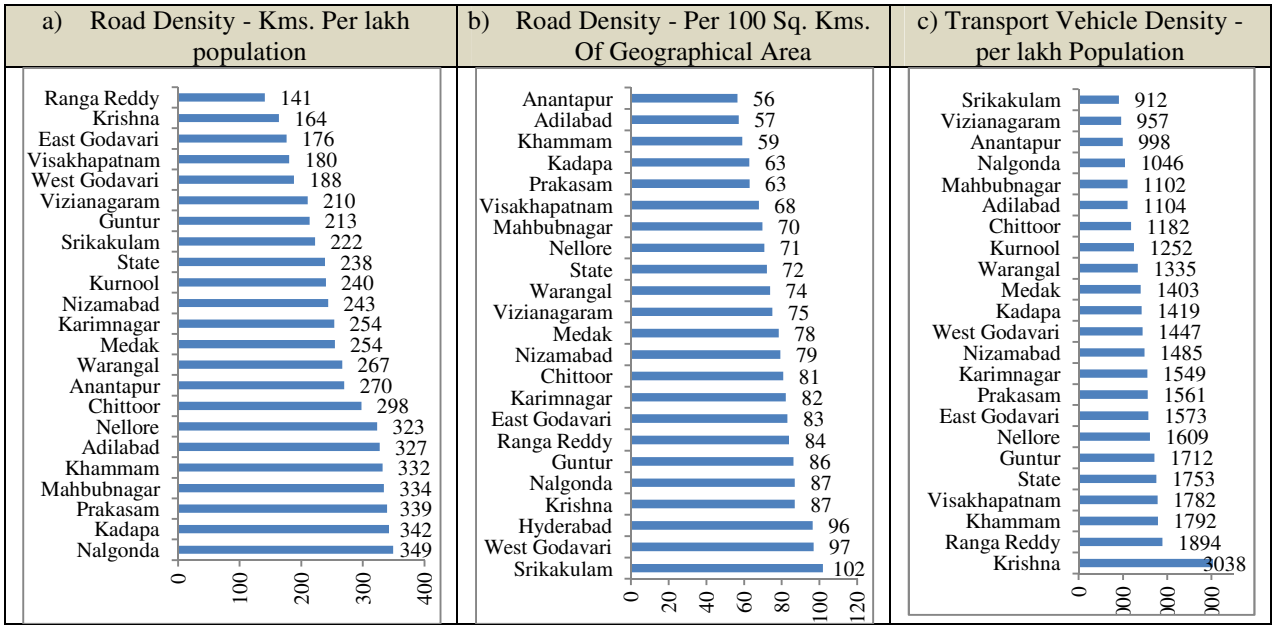
Across districts the road density in terms of length of road (Kms) available per lakh population varies between the highest 349 Kms to that of the lowest 141 Kms. (Figure 1.2a). The road density is the highest in Nalgonda district excluding Hyderabad followed by Kadapa, Prakasam, Mahabubnagar and Khammam districts; and the density is the lowest in Rangareddy district followed by Krishna, East Godavari, Visakhapatnam and West Godavari districts.

**Figure 1.1: Distribution of Roads in A. P. by Type and Agency that Maintained, 2009**




**Source**: Directorate of Economics and Statistics, Hyderabad.

**Figure 1.2: Road and Vehicle Density across District of Andhra Pradesh, 2009**




**Source**: Directorate of Economics and Statistics, Hyderabad.

Whereas the road density in terms of length of road (Kms) available per 100 Sq Kms of geographical area (GA) across districts has shown a different order (Figure 1.2b). It varied between the highest 142 Kms to that of the lowest 56 Kms. The road density based on GA is the highest in Srikakulam district excluding Hyderabad followed by West Godavari, Krishna, Nalgonda and Guntur districts; and the density is the lowest in Anantapur district followed by Adilabad, Khammam, Kadapa and Prakasam districts.

Although having the road connectivity/infrastructure is necessary but not the sufficient condition for the movement of people, goods and services and thereby access to market and public services. The mode and mechanisms of transportation facilitates the movement and access to market and public services.

**Table 1.3: Transportation and Other Vehicle Density in Andhra Pradesh, 2011**

| Sno | Type of Transportation Vehicles | Number | Per Lakh Pop. |
|---|---|---|---|
| ***1*** | ***2*** | ***3*** | ***4*** |
| **I** | **Transport** | | |
| 1 | Stage Carriages | 25493 | 27 |
| 2 | Contract Carriages | 59966 | 72 |
| 3 | Goods Vehicles (Heavy+ Medium +Light+ Three Wheelers) | 472830 | 568 |
| 4 | Tractors &Trailers | 627915 | 258 |
| 5 | Total School Buses & Private Service Vehicles | 22356 | 27 |
| 6 | Total Transport Vehicles (1 to 5) | 1458392 | 1753 |
| **B** | **Others: Non-transport** | | |
| 7 | Motor Cars, Jeeps & Omni Bus | 606036 | 729 |
| 8 | Two Wheelers | 5562201 | 6687 |
| 9 | Ambulances | 5363 | 6 |

**Note**: For calculating per lakh population, the projected population of RGI for the year 2009 is considered.

**Source**: DES (2009)

The transport vehicle density indicates that there are 1753 transport vehicles (including goods and people) available per lakh population in the state (Table 1.3). It is important to note that there are only 27 stage carriages (public and private buses) per lakh population. These stage carriages are regularly operated transport vehicles carrying people. On the other hand privately owned (at individual level) vehicle density indicates that there are 729 motor cars/jeeps/omni buses and 6687 two wheelers per lakh population. To meet the emergencies in medical care of people in the state there are six Ambulances per lakh population.

Across districts the transport vehicle density varies between the highest three thousand vehicles per lakh population of that of the lowest 912. The transport vehicle density is the highest in Krishna excluding Hyderabad followed by Rangareddy, Khammam, and

Visakhapatnam; and the density is the lowest in Srikakulam followed by Vizianagaram, Anantapur, Nalgonda and Mahabubnagar.

Andhra Pradesh State Road Transport Corporation is the single largest public transport system for carrying people in the state. Also it (APSRTC) is one of the best transport systems running across states in India. The Corporation has run about 22 thousand buses all over the state in 2010-11. These 22 thousand buses are operated around 290.0 Cr. Kms. and carried 464 Crore passengers (Table 1.4). If we consider the estimated population of the state as 8.3 crores and the 464 crore passenger carried by the APSRTC during 2010-11, it can be derived that each person of the state is alighted APSRTC buses, on average, 62 times during the year.

**Table 1.4: Working of APSRTC**

| Year | Average N0. of Buses in Use | Buses Operated (Cr. kms.) | No. of Passengers Carried (Cr.) |
|---|---|---|---|
| ***1*** | ***2*** | ***4*** | ***5*** |
| 2002-03 | 19157 | 223.58 | 409.93 |
| 2009-10 | 21606 | 277.00 | 489.00 |
| 2010-11 | 22265 | 290.00 | 464.00 |

**Note**: 1. Col. 2 = Corporation Buses + Hired Buses; 3. Sum Total of the length of all the routes in operation.
**Source**: 1. DES (2009); 2. Managing Director, A.P.S.R.T.C. Hyderabad

Having remarkable performance of the state over a period of time in terms of physical connectivity through road network and transportation, the exclusion of villages from the road network and transportation undermines the achievement.

**Table 1.5: Percentage of Villages without Facility, Andhra Pradesh**

| Facility | | 1991 | 2001 | *Change* |
|---|---|---|---|---|
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** |
| 1 | Transport Facility | 53.4 | 28.8 | 14.6 |
| 2 | Approach Road: **Pucca** | 59.0 | 28.4 | 20.6 |

**Note**: Change is difference between 1991 and 2001.
**Source**: Census: Village Directory, 1991&2001

Although the updated data is not yet available for 2011 Census, but the 2001 Census information has shown that more than one-four of the villages in the state are without pucca approach road and without any public transportation facility.

*1.1b Rail Connectivity*

The grand railway line connecting northernmost and southernmost points of Indian geography, Jammu-Delhi-Kanyakumar line, passes through Andhra Pradesh. Also railway line connecting Eastern India and Southern states, Kolkata-Kanyakumar line passes through

the state. The railway line in the state connects it with its neighboring state Orissa, Maharastra, Karnataka and Tamil Nadu. Almost all the districts in the state have been connected with railway line/network. Most of the narrow gauge and meter gauge line in the state are converted to broad gauge.

**Table 1.6: Length of Railway route and number of Stations in Andhra Pradesh, 2009-10**

| Sno | Name of the Railway | No. of Stations | Route Kilometerage (in kms.) | | | |
|---|---|---|---|---|---|---|
| | | | Broad gauge | Meter gauge | Narrow gauge | Total |
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** | ***7*** |
| 1 | South Central Railway | 583 | 4,102.70 | 184.66 | 0.00 | 4287.36 |
| 2 | Southern Railway | 16 | 120.85 | 0.00 | 0.00 | 120.85 |
| 3 | East Coast Railway | 75 | 553.65 | 0.00 | 36.69* | 590.34 |
| Total | | 670 | 4,777.20 | 184.66 | 36.69 | 4998.55 |

Note: *The Narrow-gauge between Naupada in A.P and Ganupur in Orissa is under gauge conversion and the line is closed since 24.07.2004; Reference date as on 31.3.2009.

Source: DES (2009).

Andhra Pradesh has a total length of 4550 Kms of railway lines (including all the different types – broad, meter and narrow gauge) in the year 1956-57 and it is gradually increased to 4998 Kms in 2008-09 (Table 1.6). In addition there are proposed lines in the pipeline.

*1.1c Air Connectivity*

The state of Andhra Pradesh is having relatively better air connectivity with the rest of the major cities in India as well as cities across the world. The state is having the first Greenfield Airport of the country at Hyderabad and it is ranked as the 5$^{th}$ best airport in the world. The other functional airports in the state are Visakhapatnam, Vijayawada, Rajahmundry and Tirupati. Besides, the Government is planning for construction of airports in eight other places: Guntur, Ongole, Nellore, Warangal, Kadapa, Tadepalligudem, Kurnool and Ramagundam.

**Table 1.7: The Movement of Domestic Aircrafts, Passengers and Cargo - Average Per Day in Functional Airports of Andhra Pradesh, 2008-09**

| Sno | Airport | Aircrafts | Passenger | Cargo |
|---|---|---|---|---|
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** |
| 1 | Hyderabad | 188 (33) | 12736 (4293) | 71 (81) |
| 2 | Rajahmundry | 25 | 339 | 0 |
| 3 | Tirupathi | 10 | 425 | 0.07 |
| 4 | Vijayawada | 6 | 175 | 0 |
| 5 | Vizag | 42 | 1641 | 2 |

**Note**: 1. Figures in parenthesis are related to international; 2. Aircrafts and passengers are in numbers and Cargo is in tonnes.

**Source**: 1. CSO (2010) ***Infrastructure Statistics***, MoSPI, GOI, 2. DGCA, M/o Civil Aviation, GOI.

Of all the functional airports in the state the movement of aircrafts and traffic handled is the highest in Hyderabad Airport. On an average the Hyderabad airport handles 188 domestic aircraft movement and 13 thousand domestic passenger and 71 tonnes of cargo, per day (Table 1.8).

**Table 1.8: Total Traffic Handled at Hyderabad Airport**

| Year | Aircraft Movements | Passengers (Numbers) | | | | Freight (Tonne) | | | Mail (Tonne) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Embarked | Disembarked | Total | Transit | Loaded | Unloaded | Total | Loaded | Unloaded | Total |
| *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* |
| **Domestic** | | | | | | | | | | | |
| 2003-04 | 22204 | 782930 | 838430 | 1621360 | 0 | 7599 | 7377 | 14976 | 688 | 976 | 1664 |
| 2007-08 | 70980 | 2835588 | 2706200 | 5541788 | 0 | 11999 | 15120 | 27119 | 583 | 649 | 1232 |
| **International** | | | | | | | | | | | |
| 2003-04 | 5873 | 316171 | 294235 | 610406 | 0 | 5502 | 7075 | 12577 | 0 | 0 | 0 |
| 2007-08 | 10992 | 725170 | 718090 | 1443260 | 0 | 14481 | 9578 | 24059 | 0 | 0 | 0 |
| **Total** | | | | | | | | | | | |
| 2003-04 | 28077 | 1099101 | 1132665 | 2231766 | 0 | 13101 | 14452 | 27553 | 688 | 976 | 1664 |
| 2007-08 | 81972 | 3560758 | 3424290 | 6985048 | 0 | 26480 | 24698 | 51178 | 583 | 649 | 1232 |

**Source**: Directorate General of Civil Aviation, Govt. of India.

The Hyderabad Airport has shown a remarkable growth in terms of traffic handled (both the passengers and freight) during the last four years. The domestic aircraft movements have increased three times between 2003-04 and 2007-08 and international aircraft movements had doubled during the same period. Similarly the number of passengers embarked and disembarked also shown a three times increase in the domestic sector and two times increase in the international sector.

*1.1d Port Connectivity*

The state of Andhra Pradesh is having second largest coastline 970 Km, next to Gujarat (1600 Km). However, the state is yet to harness its vast coastline advantage. Unlike Gujarat (having 42 ports) the state of Andhra Pradesh is having a very few ports in its coastline. Visakhapatnam is the major port in Andhra Pradesh and one of the largest and busiest major ports in India. It is one of the 13 major ports in the country administered by Port Trust of India.

The other major port projects that the state is about to complete under PPP mode are Krishnapatnam, Gangavarm, Nizampatnam and Kakinada. The state is the first one in terms of development of ports in the private sector. The Kakinada port comprises of Anchorage Port, Kakinada Deep Water Port and Kakinada Fishing Harbour. The Kakinada Deep Water Port located between Visakhapatnam and Chennai Ports. It has the opportunity to handle a

mix of bulk, liquid, break bulk, containers, project cargoes and service offshore oil and gas exploration activities of K-G Basin. Krishnapatnam, located at 24 Km distance from Nellore, has handled 8 million tonne of cargo in its first 8 months operations. Gangavaram Port has been developed as all weather, multipurpose and deepest port in India with a depth up to 21 meters capable of handling Super Cape size vessels of up to 200000 DWT. The state is also having minor ports at Machilipatnam, Mutyalampalem, Bhavanapadu, Kalingapatnam, Bhimunipatnam, Narsapur and Vodarevu. These ports have similar potentials for being developed as major ports in the state.

### *1.2 Energy*

Energy requirement in the development process is phenomenal and availability of technologies for developing different sources of energy makes the difference in the development process. Deprivation of people's access to source of energy keeps the human development at lower levels.

*1.2a Power Sector*

In Andhra Pradesh power/electricity is an important sector that gained policy attention thereby priority in resource allocation during 1950s to 70s. The state has emerged as a key player in the country's power sector and the stands first in the generation of hydroelectric power. Most of the power generation in the state is through thermal and hydro power plants. In the recent period the state is promoting clean technologies in the energy sector, such as wind, solar and bio-mass. Most of the power generation and distribution units in the state are in the hands of public sector. The state is also promoting merchant power plant through PPP models and encouraging captive power plants in various industrial units for their self consumption. In terms of performance, the state's power sector emerged as the one of the best performing ones in India.

The installed capacity of power sector has increased from 213 MW to 15000 MW during the last five decades between 1959 and 2011. In the recent past private sector's contribution has been increasing, around one-fourth of the total installed capacity in the state. However a large part of the installed capacity in private sector is yet to come in to operational in terms of power generation. Of the total installed capacity about 49.8 per cent is from Thermal and another 26 per cent is in Hydel power sector.

**Table 1.9: Installed Capacity (MW) under Different Energy Systems in A. P., 2011**

| Sno | Energy Systems | APGENCO | Joint Sector | Private Sector | Central Sector | Total | % of each system |
|---|---|---|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* |
| 1 | Thermal | 4592.50 | - | - | 2882.68 | 7475.18 | 49.8 |
| 2 | Hydel | 3790.36 | - | 104.40 | - | 3894.76 | 26.0 |
| 3 | Wind | 2.00 | 272.00 | 187.74 | - | 461.74 | 3.1 |
| 4 | Gas | - | - | 2494.70 | - | 2494.70 | 16.6 |
| 5 | Co-generation & Bio-mass Projects | - | - | 490.55 | - | 490.55 | 3.3 |
| 6 | Mini Power Plants | - | - | 74.31 | - | 74.31 | 0.5 |
| 7 | Solar | - | - | 2.00 | - | 2.00 | 0.0 |
| 8 | Others (other gas Wells, Waste Heat and Industrial Waste) | - | - | 109.80 | - | 109.80 | 0.7 |
| Total | | 8384.86 | 272.00 | 3463.50 | 2882.68 | 15003.04 | 100.0 |
| % of Sector in Total | | 55.9 | 1.8 | 23.1 | 19.2 | 100.0 | |

**Source**: Socio-Economic survey, 2012. Planning Department, Government of Andhra Pradesh.

The total number of connected services has grown from 2.7 lakh to 218.3 lakhs (2009-10) and the energy handled per annum rose from 686 MU to 51123 MU during the last five decades. The annual revenue increased from Rs.5.50 crores to Rs. 10170 crores. The total power generation in the state during the year 2008-09 was 67387 million-kilo Whatt Hours (MKWH). The state is the third largest state in gross generation of power, among Indian states next to Maharastra and Gujarat. In the south it is the largest. Of the total power generated in the state the largest contribution comes from thermal system, about two-thirds of the total, either in the central sector or the state sector, and the Hydel sector's contribution ranges from 7% to 12% depending up on the rainfall and storage of hydel projects. The rest was the contribution of others that include the purchases from private sector, gas and captive power plants. The private sector's contribution is substantial.

**Table 1.10: Power Generation by Energy Systems in Andhra Pradesh**

| System | Million Units | | % in Total Generation | |
|---|---|---|---|---|
| | 2008-09 | 2009-10 | 2008-09 | 2009-10 |
| *1* | *2* | *3* | *4* | *5* |
| Thermal | 23294.47 | 24101.16 | 34.6 | 32.3 |
| Hydel | 7702.54 | 5450.49 | 11.4 | 7.3 |
| Gas | 1440.69 | 2087.31 | 2.1 | 2.8 |
| Wind | 0 | 0 | 0.0 | 0.0 |
| Share from Central Sector Projects | 25315.86 | 22851.2 | 37.6 | 30.6 |
| Captive Power Plants | 747.96 | 1465.78 | 1.1 | 2.0 |
| Purchases from Other States/Regions | 0 | 0 | 0.0 | 0.0 |
| Purchases from Private Sector | 8885.24 | 18655.93 | 13.2 | 25.0 |
| Total | 67386.76 | 74611.87 | 100.0 | 100.0 |

**Note:** Ex-Bus

**Source**: Directorate of Economics and Statistics, Govt. of Andhra Pradesh

With respect to the consumption of electricity in the state it has increased manifold since its formation. During the last one decade period the consumption is doubled (Table 1.11). The growth of total power consumption in the state is found to be higher than that of all-India

average. The share of the state in the total consumption units at all-India level is increasing; it has increased from 8 to 10% during the last one decade period.

**Table 1.11: Growth of Electricity Consumption (in million units) in AP and India**

| State | 1997-98 | 1998-99 | 1999-00 | 2000-01 | 2001-02 | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | Growth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* |
| AP | 24070 | 24912 | 26221 | 27105 | 31482 | 31345 | 34166 | 38677 | 39829 | 45872 | 48861 | 7.3 |
| India | 296749 | 309734 | 312841 | 316600 | 322459 | 339598 | 360937 | 386134 | 411887 | 455749 | 501977 | 5.0 |
| % of AP | 8.1 | 8.0 | 8.4 | 8.6 | 9.8 | 9.2 | 9.5 | 10.0 | 9.7 | 10.1 | 9.7 | 2.3 |

**Note**: Growth is exponential growth and is presented in % form.

**Source**: www.Indiastat.com

The per capita consumption of electricity has also been increased over the period; it is 746 KWH in 2009. The state is among the top ten states with highest per capita consumption of electricity. However, the power generation in the state could not meet the increasing demand in the state. For instance, the energy requirement in the state for the year 2009 is estimated at 856 Kwh/person/pa (Kilo watt hours per person per annum) but the energy availability in the state is 798 Kwh/person/pa. It indicates the 58 Kwh/p/pa deficit/shortage of energy availability for the year 2009. The deficit/shortage has been increasing over a period of time.

**Table 1.12: Percentage Distribution of Power Consumption by Sources in Andhra Pradesh and India, 2009-10**

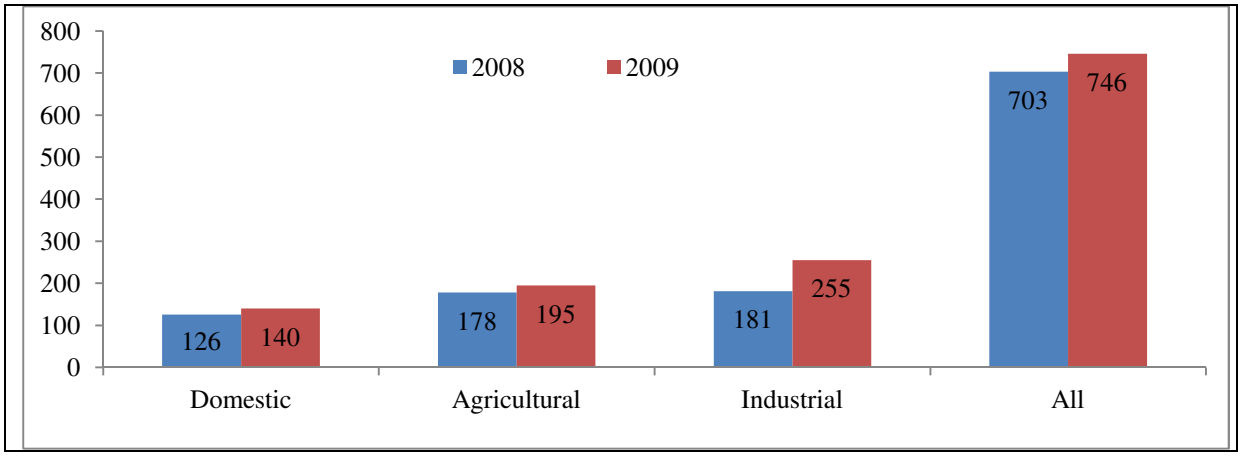
| State | Domestic | Comm-ercial | Industrial Power | | Public Lighting | Traction | Agriculture | Public Purpose | Miscell-aneous | Total Energy (GWh) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | LT | HT | | | | | | |
| *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* |
| AP | 20.11 | 6.51 | 3.96 | 33.26 | 2.15 | 2.34 | 28.64 | 1.28 | 1.75 | 65736.98 |
| India | 21.56 | 8.96 | 6.88 | 38.35 | 0.94 | 1.88 | 18.16 | 1.91 | 1.36 | 658030.64 |

**Note**: Public Water Works and Sewage Pumping.

**Source**: Ministry of Power, Govt. of India.

The distribution of power/electricity consumption across different sectors shows that industry is the single largest sector in the state that accounts relatively higher share in the total electricity consumption in the state (around 37%) as well as in India (about 45%) (Table 1.12). The share of industry in the state is lower than that of the all-India average. Agriculture particularly irrigation, in Andhra Pradesh, is the second largest sector in electricity consumption, more than one-fourth of the total consumption in the state. The share of agriculture in the state is higher than that of the all-India average.

**Figure 1.3: Per capita Power Consumption (in Kwh) in AP**



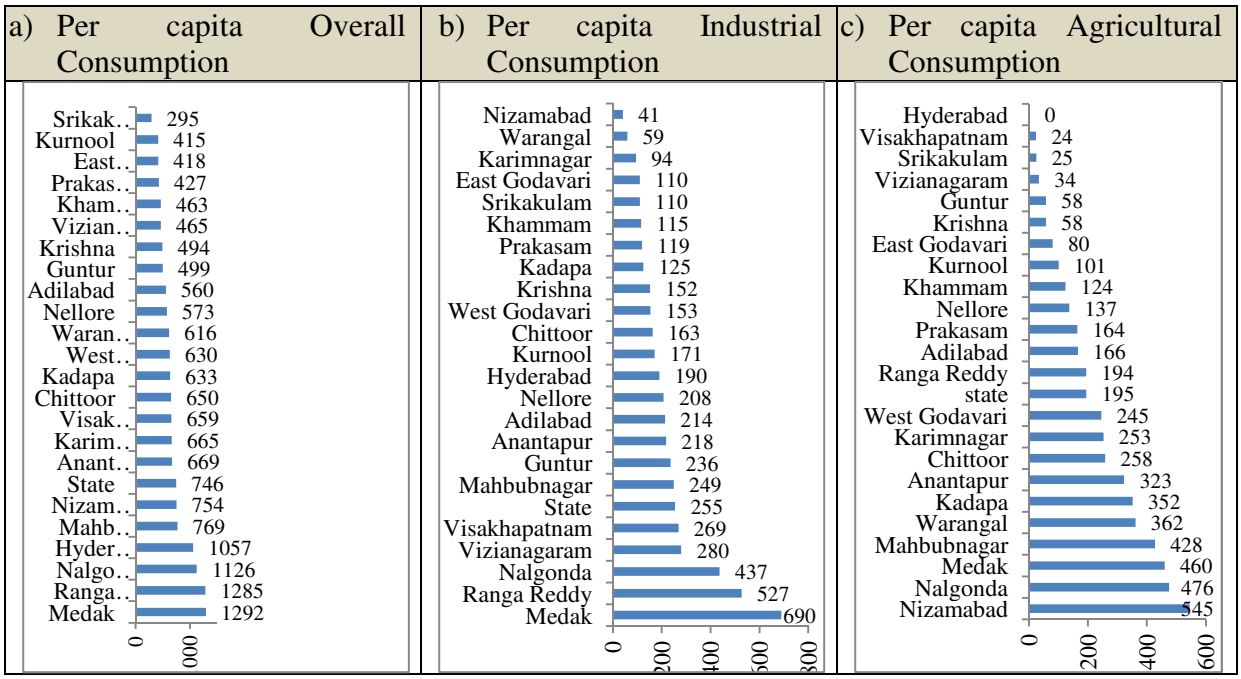

**Source**: DES (2009)

The per capita consumption of electricity (utility) in the state is 746 kwh (kilo watt hours) in 2009 and it is 43 kwh increase from 703 kwh in the previous year, 2008 (Figure 1.3). The per capita consumption of electricity (utility) in the state is highest in industrial sector followed by agriculture and domestic sectors.

The number of agricultural services in the state increased from about four thousands in the late 1950s to three lakhs by the end of the 5$^{th}$ plan and to 24 crores by the end of 2005. Andhra Pradesh was the second highest among the Indian states in terms of number of agricultural services. The number of pump sets energized through electricity in Andhra Pradesh was around 23 lakhs (as on 31$^{st}$ March 2005), which was one of the highest next to Maharastra. The power shortage is considered to be one of the contributing factors in the agrarian crisis in the state.

Across districts of Andhra Pradesh the per capita power consumption is varying in the range between 1292 and 295 kwh (Figure 1.4a). The per capita overall power consumption is the highest in Medak followed Rangareddy, Nalgonda, Hyderabad and Mahabubnagar. The lowest per capita overall power consumption is in Srikakulam followed by Kurnool, East Godavari, Prakasam and Khammam (Figure 1.4a).

**Figure 1.4: Per Capita Power Consumption (in Kwh) across District in Andhra Pradesh, 2009**




**Source**: DES (2009).

The sectoral decomposition indicates that the per capita industrial power consumption is the highest in Medak followed by Rangareddy, Nalgonda, Vizianagaram and Visakhpatnam (Figure 1.4b). The lowest per capita power consumption is in Nizamabad followed by Warangal, Karimnagar, East Godavari and Srikakulam. The relative positions of district by levels of per capita power consumption indicate that a few districts are having disproportionately higher power consumption for industrial activities which in turn indicates disproportionately higher concentration of industries in these districts.

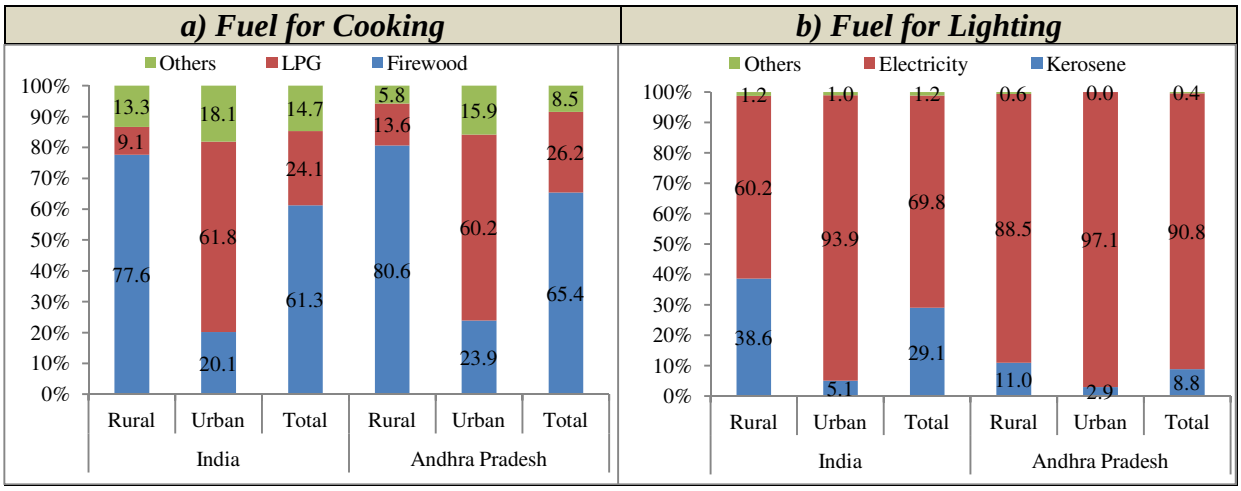
The per capita power consumption for agricultural purpose is highest in Nizamabad followed by Nalgonda and Medak, and the lowest is Visakhapatnam followed by Srikakulam, and Vizianagaram if Hyderabad is excluded given its complete urban entity and no place for agricultural activities (Figure 1.4c). The levels of per capita agricultural power consumption across districts also indicate a few districts are having disproportional higher power consumption for agricultural activities especially for irrigation. Most of these districts are located in Telangana and Rayalaseema regions.

*1.2b Fuel for lighting and cooking at the Household Level*

At the household level the energy requirement would be mostly for cooking and lighting. Andhra Pradesh is one of those Indian states, which is having almost all the villages electrified. However it does not ensure either each hamlet in the village is electrified or all the households in the electrified village/hamlet are having the electricity connection. The data has shown that about 94 per cent of the habitations/hamlets in the state are electrified in the year 2005.

With respect to the primary fuel used for lighting, about 91% of the households in Andhra Pradesh are using electricity (Figure 1.5b). Although the state is standing above the national average, still there are 8% of the households which are deprived of the electricity for the lighting. Most of these households (91%) are located in the rural Andhra Pradesh only.

**Figure 1.5: Distribution of Household by Type of Fuel for Cooking and Lighting**




**Source**: NSS 64th Round (2007-08) Consumer Expenditure (Sch. 1.0)

For the fuel for cooking still more than two-thirds of the household in the state are depending on the firewood and other traditional fuels for cooking. The high dependency on the firewood and other traditional fuels for cooking is very high in the rural areas of the state.

*1.2c Renewable Energy Systems*

Given the increasing demand for energy at the household level as well as agricultural and industrial purposes, the demand can be met while exploring and developing the renewable energy system along with developing the non-renewable energy systems. The renewable energy systems are environmental friendly.

Under the Renewable Energy Programme there are initiatives for the development of different types of renewable energy systems and devices in the state. In this regard there are 4.6 lakh biogas plants installed in the state. There are other initiatives like biomass gasifiers especially for industrial purposes, waste to energy initiatives, solar photovoltaic system, small hydro power, aerogen systems wind power and bio-power system are developed.

**Table 1.13: Cumulative Achievements of Decentralised/Off-Grid Renewable Energy Systems/Devices under Various Renewable Energy Programmes**

| Sno | Renewable Energy System | | A P | India | % of AP |
|---|---|---|---|---|---|
| *1* | *2* | | *3* | *4* | *5* |
| 1 | Biogas Plants (Nos.) | | 457938 | 4253624 | 10.8 |
| 2 | Biomass Gasifiers (KW) | Rural | - | 13287 | - |
| | | Industrial | 16681 | 107949 | 15.5 |
| 3 | Waste to Energy (KW) | | 4.95 | 46.72 | 10.6 |
| 4 | Solar Photovoltaic System | Street Lighting System (Nos) | 35799 | 797344 | 4.5 |
| | | Home Lighting System (Nos) | 1957 | 603307 | 0.3 |
| | | Solar Lanterns (Nos.) | 3914 | 119634 | 3.3 |
| | | Power Plant (KWp) | 213.3 | 2922.11 | 7.3 |
| 5 | Solar Photovoltaic Pumps (Nos.) | | 613 | 7334 | 8.4 |
| 6 | Water Pumping Wind Mills (Nos.) | | 6 | 1352 | 0.4 |
| 7 | Aerogen/Hybrid Systems (Kilowatt) | | 16 | 1072.65 | 1.5 |
| 8 | Solar Cookers (Nos.) | | 13395 | 663501 | 2.0 |
| 9 | Remote Village Electrification | Villages (Nos.) | - | 5348 | - |
| | | Hamlets (Nos.) | - | 1408 | - |
| 10 | Small Hydro Power (MW) | | 187 | 2735 | 6.8 |
| 11 | Wind Power (MW) | | 136 | 11807 | 1.2 |
| 12 | Bio-Power | Bio mass (MW) | 363 | 2200 | 16.5 |
| | | Waste to Energy (MW) | 36 | 65 | 54.9 |
| 13 | Solar Power (MWp) | | 0 | 10 | 1.0 |
| Total Capacity (MW) | | | 722 | 16817 | 4.3 |

**Note**:

**Source**: www.Indiastat.com

However, the development of the renewable energy systems in the state is still in the infant stage. Vast coastal area in the state as a resource base for developing tidal energy system is not attempted.

### *1.3 Communication Infrastructure*

Communication infrastructure is important as it facilitates the exchange of market information or the other information and ideas across people along with sharing emotions.

In Andhra Pradesh, there are 16149 post offices in 2009 serving its 83 million people (Table 1.14). It was around 19 post offices per lakh population in the state. There are four thousand telephone exchanges and 56.6 lakhs telephone connections and 2 lakh public telephones in the state. It would be 68 telephone connections and 2 public telephones per every thousand people in the state.

**Table 1.14: Post, Telegraph and Telephone Connectivity in Andhra Pradesh**

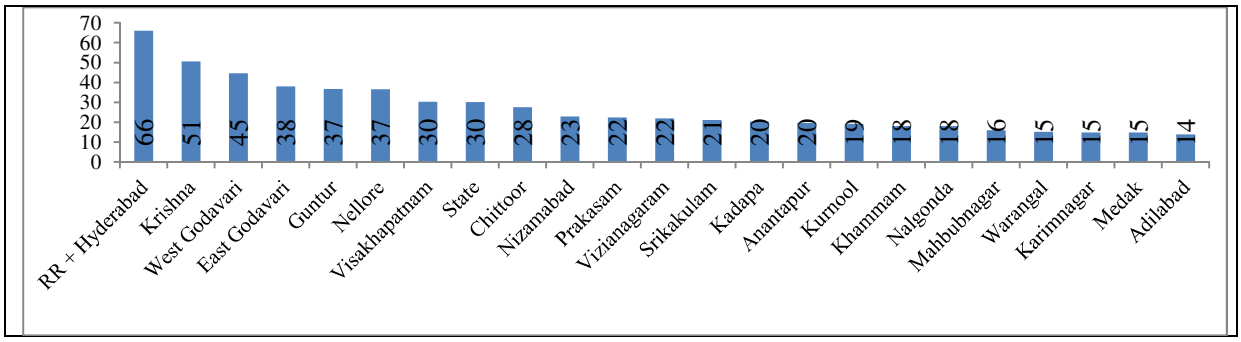
| Sno | Item | Unit | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* |
| I | **Total Post Offices** | Nos | 16190 | 16177 | 16222 | 16149 | 16149 |
| | 1. Head Offices | " | 100 | 101 | 98 | 104 | 96 |
| | 2. Sub Offices | " | 2367 | 2355 | 2343 | 2333 | 2341 |
| | 3. Extra Departmental Sub Offices | " | 44 | 35 | 27 | 31 | 31 |
| | 4. Branch Offices | " | 13679 | 13686 | 13754 | 13681 | 13681 |
| II | Telephone Exchanges | " | 3341 | 3568 | 3677 | 4070 | 4166 |
| III | Telephone Connections | Lakhs | 32.6 | 44.2* | 29.3** | 49.3* | 56.6* |
| IV | Telegraph Offices | Nos | 106 | 114 | 80 | 185 | 168 |
| V | Public Telephones | Lakhs | 2.3 | 2.8 | 2.7 | 2.4 | 2.0 |

**Note**: Reference date as on 31st March; * Includes Land line, WLL and Cell Phones; ** Includes WLL excluding Cell Phones.

**Source**: 1. DES (2009); 2. Chief Postmaster General, A.P. Circle, Hyderabad; 3. Chief General Manager, Telecommunications, A.P. Circle, Hyderabad.

According to Telecom Regulatory Authority of India (TRAI) there are 51.63 million access service subscribers (including both the land and wireless) in Andhra Pradesh as on June 2010. More than the wireline/landline connections, the spread of wireless access services is wider. Of the total access service subscribers in the state 95% of them are wireless subscribers (49.21 million). Moreover there are about 1.2 million internet subscribers in the state. Having such a huge base the state is contributing about 8% of the total subscribers at the all-India level.

**Figure 1.6: Tele density - Number of Telephone Connection per 1000 persons, 2009**




**Source**: DES (2009).

The tele density according TRAI data is 613 access service subscribers (all types) per every 1000 persons in the state. The landline tele density is very smaller than that of the wireless. In comparison with all-India average the (wireless and landline) teledensity in the state is relatively higher especially wireless subscribers.

Higher levels of tele density in the state do not indicate that as many people as they are in the state are having access to telephones/mobiles. It must be noted that total number of

subscribers includes those of household and non-household (i.e. government, corporate, business and commercial organisation) sectors. It is evident that there may be number of connections/subscriptions in each organisation/entity of the non-household sector.

**Table 1.15: Number of Subscribers and Tele Density in Andhra Pradesh and India, 2010**

| Sno | Parameter/indicator | AP | India |
|---|---|---|---|
| ***1*** | ***2*** | ***3*** | ***4*** |
| 1 | Access Service Subscribers (in Millions) | 51.63 | 671.69 |
| 2 | Mobile Telephone (Wireless) Base (in millions) | 49.21 | 635.51 |
| 3 | Internet/BB Subscribers base (in millions) | 1.2 | 16.72 |
| 4 | Population (in millions) | 84.2 | 1180.7 |
| 5 | Total Tele Density (Subscribers per 1000 Persons) | 613 | 568 |
| b | No of Landline Subscribers per 1000 Persons | 19 | 31 |
| c | No of Wireless Subscribers per 1000 Persons | 584 | 538 |
| d | No of internet user per 1000 Persons | 14 | 14 |

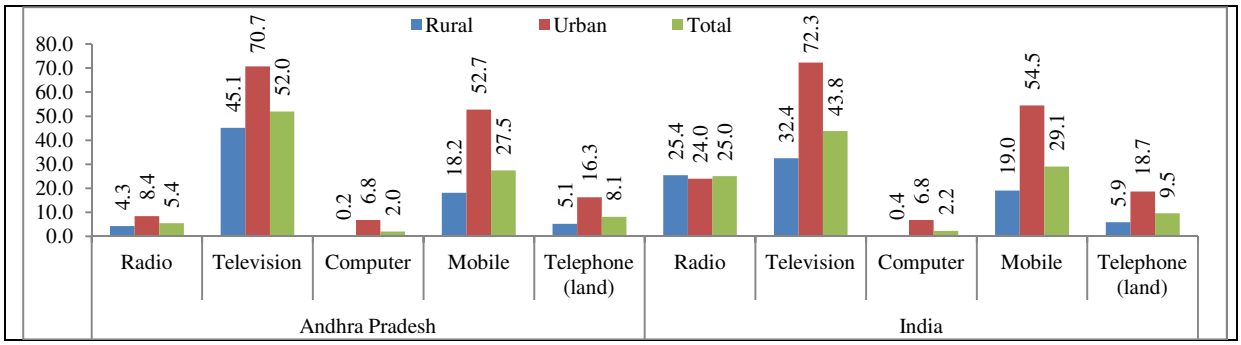
**Note**: 1. Access Service Subscribers includes both the wireless and wire line (landline); 2. Tele Density is per thousand population; 3. Reference date June 2010.

**Source**: TRAI Report, October 2010.

The household level data clearly indicates the similar observation. The household level data has shown that only 8% of the total households in the state are having telephone (landline) connection and 27.5% are having access to mobile phone. This data refers to households having at least one connection only. Within the household, there may be chances of having more than one connection/subscription especially in the middle and above economic classes. Therefore high teledensity at the state level could be due to multiple connections in the non-household sector and more than one connection within the sector.

In urban areas the percentage of households having the telephone/mobile connection is higher than that of rural ones. When compared to all-India average, the percentage of households having telephone/mobile connection is lower in the state. The difference in the state having relatively higher tele density over all-India average but the relatively lower percentage of households reporting telephone/mobile connections may be attributed to higher number of connections at non-household sector.

**Figure 1.7: Percentage of Households having Communication Devices in AP and India, NSS 64th Round (2007-08)**




**Source**: NSS 64th Round (2007-08) Consumer Expenditure (Sch. 1.0).

The other important communication devices at the household level are Radio, Television, and Computers. Of these Television appears to most prevalent one, more than half of the total household in the state are having Television set (Figure 1.7). There exists rural-urban differences; the percentage of households having Television is 26% higher than that of rural areas. In comparison with all-India average, the state is relatively better and importantly rural-urban difference is lower.

## *1.4 Financial Infrastructure*

Financial infrastructure is an important factor in the economic development of the society. The initial growth models have emphasized on the capital (particularly savings and investment) in the process of growth of an economy. Financial resources far most important not only at the macro level but also at the micro level. It is observed in the literature that one of the factors limiting the development of rural and agrarian economy is access credit market especially that of formal and institutional.

### *1.4a Formal/Institutional Finance*

The institutional financial system in India as well as in Andhra Pradesh comprising of scheduled commercial banks and co-operative banks, various types of non-banking financial organizations, capital market institutions and insurance and pension funds.

The number of scheduled commercial bank branches in the state is 6635 at the end of the year 2009 and it forms around 8 bank branches per lakh population or 13 thousands population per bank branch. There are around 6 crore bank accounts in the scheduled commercial banks in the state. The number of bank accounts in the state are more than its total number of

households. Moreover, it indicates that for every three persons in the state there are two bank accounts. The number accounts include both household and non-household (Government, business, industrial and other commercial organizations) sector. There are chances for having multiple number of accounts within a household and for an organization in the non-household sector. Therefore the macro data hides the facts more than it reveals wherein there may be a large number of households which do not have any bank account.

**Table 1.16: Banking Activities in Andhra Pradesh**

| State/Sector | No. of Branches | No. of Accounts | Deposits Amount | Credit Amount Outstanding | Credit/Deposit Ratio |
|---|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* | *6* |
| **Andhra Pradesh** | **6635** | **60210893** | **21835010** | **21038480** | 96 |
| Rural | 2370 | 16565498 | 2232252 | 2458449 | 110 |
| Semi-Urban | 1527 | 18546388 | 3754005 | 2818847 | 75 |
| Urban | 1680 | 15287871 | 5628718 | 4501954 | 80 |
| Metropolitan | 1058 | 9811136 | 10220034 | 11259230 | 110 |

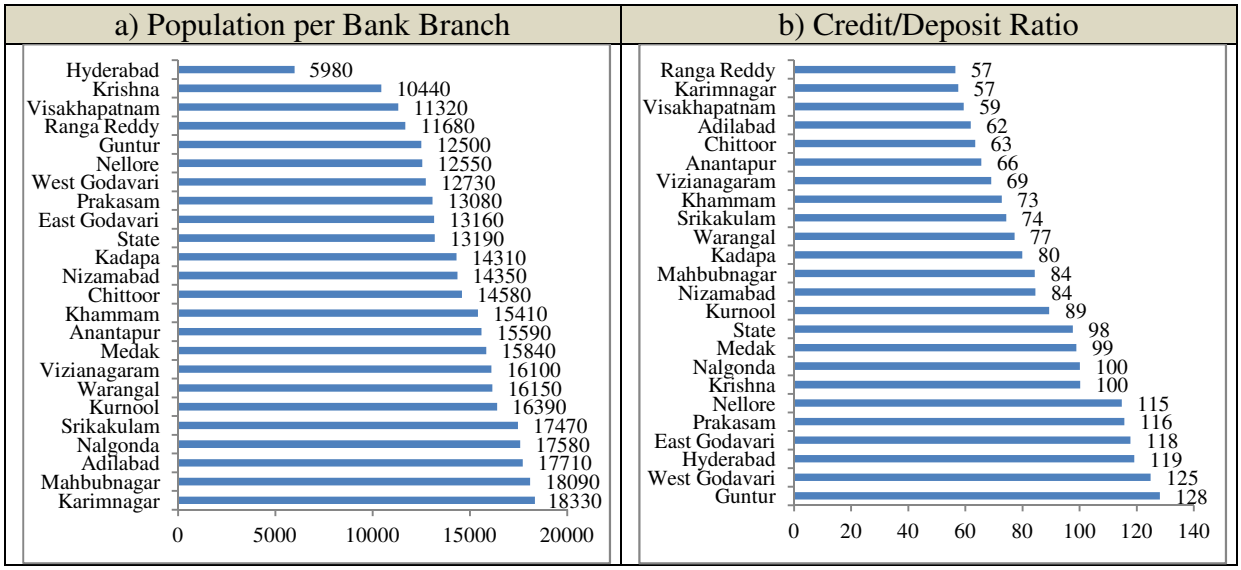
**Note**: 1. Scheduled Commercial Banks only; 2. Figure presented in column 4&5 are in lakhs.
**Source**: 1. www.indiastat.com; Reserve Bank of India (RBI).

The aggregate deposits of these commercial bank offices amounted to Rs. 218350 crores which, comes to about Rs. 2600 per capita deposits. Total bank credit advanced was of Rs. 210384 crores and forms as Rs. 2500 per capita, in the state. In the all-India context the state ranks 14$^{th}$ among the Indian states in terms of both the population per bank branch and per capita deposit whereas in terms of per capita credit it stands at 7$^{th}$ position.

The distribution of bank branches across locations indicate that around two-thirds of the branches are in urban or semi-urban location and the remaining one-third is located in rural settings. It indicates relative advantage of urban sector and disadvantage of rural sector in terms of access to formal credit/financial institutions.

The coverage of bank branch in terms of the average population per bank branch across district indicates that there exists wide variation (Figure 1.8a). It is to be noted that higher the average of population per branch lesser the access in relative terms when compared that of lower average of population per branch. While Karimnagar is having the highest population per branch and it is followed by Mahabubnagar, Adilabad, Nalgonda and Srikakulam, the lowest population per branch is observed for Hyderabad and it is followed Krishna, Visakhpatnam, Rangareddy and Guntur.

**Figure 1.8: Coverage of Banks across Districts in AP, 2009**




**Source**: DES (2009).

With respect to credit deposit ratio, it is the highest in Guntur followed by West Godavari, Hyderabad, East Godavari and Prakasam (Figure 1.8b). The lowest credit deposit ratio is observed for Rangareddy followed by Karimnagar, Visakhpatnam, Adilabad and Chittoor.

*1.4b Micro-Finance Institutions*

Financial exclusion is one of severe problems of that India is facing. In spite of the remarkable progress achieved in the development of institutional finances, there are a large segment of people especially the poor and vulnerable sections who have been excluded from the access to credit from these formal financial institutions. The emergence micro finance system was considered to be an instrument realizing the goal of financial inclusion as it can serve a large segment of the population who has been without access to banks/formal/institutional financial systems. It is an extended formal financial system under the umbrella of non-banking financial companies (NBFCs).

In Andhra Pradesh the micro finance initiatives have been there ever since the beginning of Self-Help Group movement. The state funded micro finance institution in Andhra Pradesh is Self-Help Groups (SHG) based SERP Programme. One of the government welfare schemes initiated during the last five years is '*pavala vaddi'* scheme which is to increase the access to credit at a cheaper interest rate to the women especially to the members of SHGs.

Besides, there are number of private sector micro finance institutions emerging in India, many of them are operating their activities in the state. Around 30 percent of micro finance activities in India in the private sector are concentrated in Andha Pradesh.

In the recent past the micro finance institutions in the state especially those of the private sector are under scanner due to their excessive interest rates and harassment of borrowers by their collection agents. Subsequently the state has taken measures to tighten regulation governing the micro finance industry.

*1.4c Informal/Non-Institutional Finance*

The structure of informal/non-institutional market is heterogeneous and the sector comprises partnership firms, sole proprietary concerns, own account enterprises, financial auxiliaries such as share broking firms, loan brokers, NGOs helping SHGs, share brokers and traders, and other traditional money lenders (referred with different names at different locations). Although the share of institutional financial institution in total credit market is increasing over a period and thereby increasing the access to formal financial institutions, still the informal/non-institutional financial market playing considerable role especially in the rural credit market.

**Table 1.17: Distribution of Loans by Source - Rural Labour Households, 2004-05**

| Sno | Source of Loan | % in Loan Amount | | % in Number of Loans | |
|---|---|---|---|---|---|
| | | Andhra Pradesh | India | Andhra Pradesh | India |
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** |
| 1 | Government | 1.0 | 3.2 | 0.9 | 1.8 |
| 2 | Cooperative Society | 2.8 | 9.3 | 2.7 | 5.5 |
| 3 | Bank | 11.5 | 16.5 | 7.5 | 7.3 |
| 4 | Employer/Landlord | 7.3 | 5.4 | 8.8 | 6.9 |
| 5 | Agricultural/Professional Money Lender | 67.2 | 44.2 | 59.6 | 31.9 |
| 6 | Shopkeeper/Trader | 3.1 | 6.1 | 11.6 | 26.9 |
| 7 | Relatives/Friends | 4.3 | 12.8 | 5.9 | 16.7 |
| 8 | Others | 2.7 | 2.7 | 3.0 | 3.0 |
| **Total** | | **100** | **100** | **100** | **100** |

**Note**: Figure presented in percentage form.

**Source**: NSS 61st Round (2004-05) Employment and Unemployment unit record data.

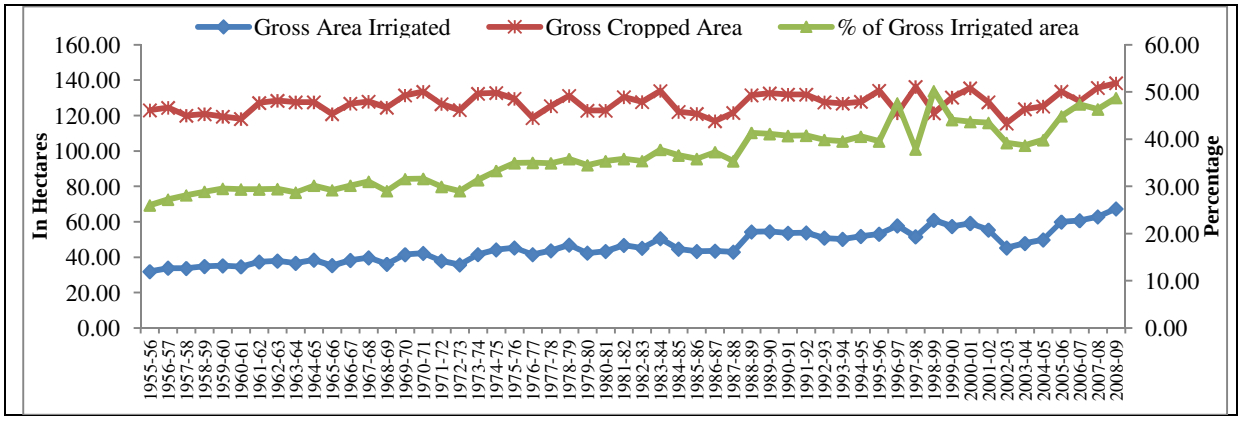
In the total number of outstanding loans among the rural labour households, 60% of the loans in Andhra Pradesh are borrowed from money lenders (Table 1.17). The source of money lender accounts 67% of the total amount of outstanding loans among the rural labour households in the state. The percentage of both loan amount and number accounted for money lenders in the state is higher than that of the national average.

### *1.5 Irrigation*

The state of Andhra Pradesh is primarily an agrarian economy as a majority of the people in the state depend upon agriculture for their livelihood. Herein irrigation infrastructure plays important role for the development crop production. In response the investment in irrigation sector has been the priority in the budget allocation to increase the agricultural growth in the state ever since the inception of the *first five-year plan*. About three decades covering from 1950s to 1970s, irrigation has accounted major share of public expenditure in Andhra Pradesh. During the *pre-plan period* 27.02 lakh hectares of ayacut was developed for irrigation. About 18771.36 crores were spent from the *first plan* to the year 2004-05 and created irrigation potential of 27.67 lakh hectares. The total area irrigated (Gross) was 67 lakh acres 2007-08 and it comes to around 48 per cent of the gross cropped area in the state.

Andhra Pradesh has been one of the major Indian states, which have the highest percentage of area under irrigation. The rapid growth in area under irrigation in the state till 1980s was reversed during the 1990s and thereafter (see Figure 1.9). In the recent policy priorities once again irrigation assumed its importance and considerable amount of resources are earmarked under the policy initiative ***Jalayagnam*.** The amount and percentage of expenditure on Irrigation & Flood Control has been the highest in the state among all Indian states[1] during the last three years.

**Figure 1.9: Growth of Gross Cropped and Irrigated Area (lakh Hec.) in Andhra Pradesh**

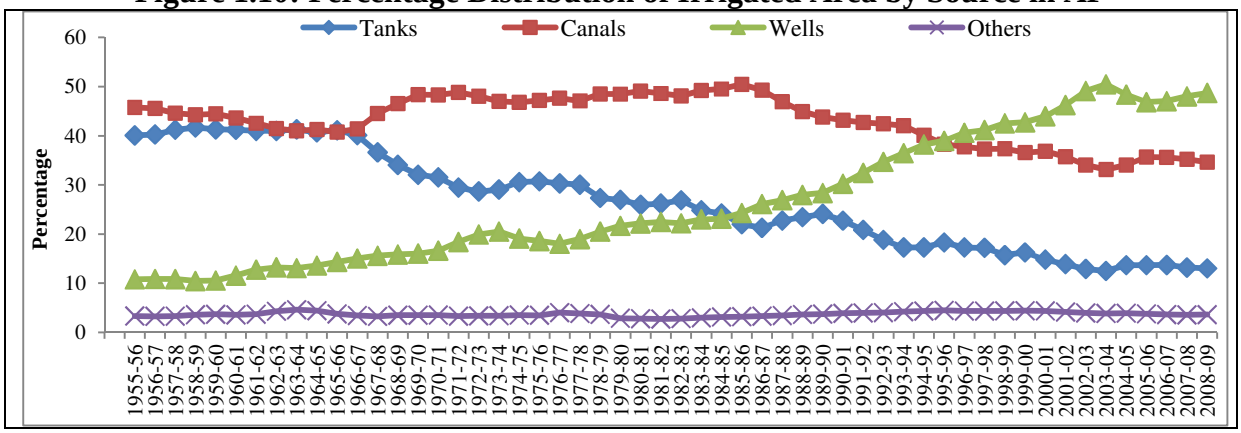



**Source**: Directorate of Economics and Statistics, Hyderabad.

[1] Given the longer gestation period of major irrigation projects, the expected results of this policy initiative take time to evaluate.

However, the trends in the distribution of irrigated area by sources of irrigation indicate that the percentage of area irrigated under tanks has been continuously declining ever since the state formation (see Figure 1.10). Correspondingly there has been a continuous increasing in the percentage of area irrigated under wells and tube wells; at present it accounts about half of the total net area irrigated. The percentage of area irrigated under canals had increased during the mid-1960s and stagnated thereafter in 1970s and 1980 and then it has shown a declining trend since 1990s.

**Figure 1.10: Percentage Distribution of Irrigated Area by Source in AP**




**Source**: Directorate of Economics and Statistics, Hyderabad.

The rate of growth in the gross area irrigated during the last five decadal periods is higher than the gross cropped area in the state. During last half of 20$^{th}$ century, period during 1980s has shown the highest rate of growth in gross area irrigated (see Table 1.18). Again in the recent past the rate of growth in gross area irrigated is very high. Among the sources of irrigation, area irrigated under wells and tube wells has been the highest in the state throughout the last fifty years period.

**Table 1.18: Rate of Growth (%) in Irrigated Area in Andhra Pradesh**

| Year | Irrigated areas by Source | | | | | | Cropped Area | |
|---|---|---|---|---|---|---|---|---|
| | Tanks | Canals | Wells | Others | NIA | GIA | NCA | GCA |
| *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* |
| 1960s | -0.78 | 0.87 | 4.09 | 0.97 | 0.70 | 1.27 | 0.16 | 0.45 |
| 1970s | -0.03 | 1.35 | 3.05 | 0.22 | 1.26 | 1.44 | -0.63 | -0.37 |
| 1980s | 0.32 | 0.63 | 5.15 | 5.54 | 1.87 | 1.70 | -0.14 | 0.23 |
| 1990s | -2.75 | -1.31 | 4.13 | 1.83 | 0.60 | 1.18 | -0.30 | -0.08 |
| 2001-08 | 1.10 | 1.65 | 2.46 | -0.51 | 1.86 | 2.72 | 0.47 | 0.96 |
| 1956-08 | -1.54 | 0.43 | 4.07 | 1.17 | 0.92 | 1.11 | -0.18 | 0.09 |

**Note**: 1. The Rate of Growth is exponential one; 2. Growth is based on triennium average of area in hectares; 3. 1960s includes the period 1956 to 1970.

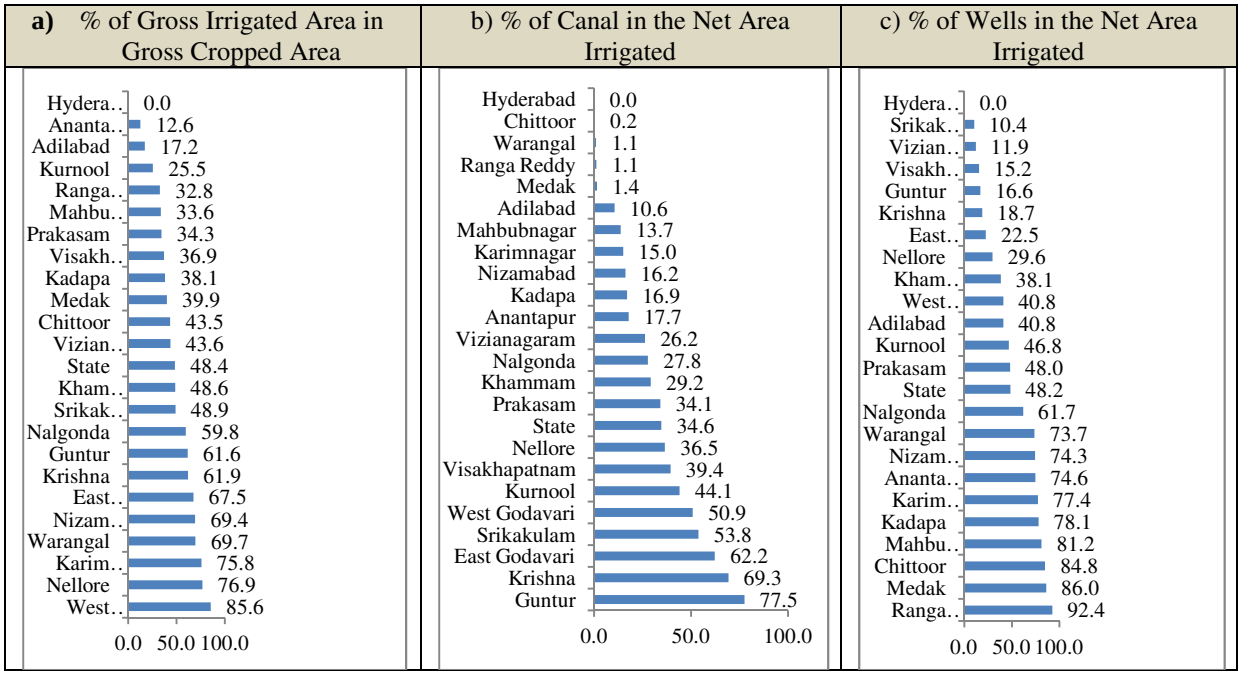
**Source**: 1. Computed; 2. Directorate of Economic and Statistics, Hyderabad.

If one categorises tank and canal as public source of irrigation since most of investment for these projects raises from public sources (government) and well and others source of

irrigation as private one, the trend indicates increasing share of the private source. It in turn indicates the increasing private pocket investment on irrigation infrastructure than that of public investment.

Across districts there is wide variation in percentage of gross irrigated area to the gross cropped area; it ranges from the highest 86% to the lowest 13% (Figure 1.11a). It is the highest in West Godavari district followed by Nellore, Karimnagar, Warangal, Nizamabad and East Godavari. It is the lowest in Anantapur district if we exclude Hyderabad, followed by Adilabad, Kurnool, Rangareddy and Mahabubnagar.

**Figure 1.11: % of Gross Irrigated Area across District, 2008-09**




**Source**: Directorate of Economics and Statistics, Hyderabad.

The distribution of irrigated by sources across districts indicates that the proportion of area irrigated under canals to the net irrigated area varies from the highest 77.5% to the lowest 1% across districts (Figure 1.11b). It is the highest in Guntur district followed by Krishna, East Godavari, Srikakulam and West Godavari districts. It is the lowest in Chittoor district excluding Hyderabad, followed by Warangal, Rangareddy, Medak and Adilabad districts.

Whereas the proportion of area irrigated under wells and tube wells to net irrigated area varies from the highest 92% to the lowest 10% across districts (Figure 1.11c). It is the highest in Rangareddy followed by Medak, Chittoor, Mahabubnagar and Kadapa. It is the lowest in

Srikakulam district excluding Hyderabad, followed by Vizianagaram, Visakhapatnam, Guntur and Krishna.

## II Social Infrastructure

Social infrastructure comprising education, health and medical care, nutrition, housing and water supply which is instrumental in contributing to substantial improvements in human development, which in turn, initiate and accelerate economic development (Gopalakrishna and Leelavathi, 2011). The social infrastructure is important for improving the social and human capital in any economy. In this regard educational levels and health conditions of the people are important. For improving educational levels of health condition the basic infrastructure that is needed is educational and health care institutions.

### *2.1 Educational Infrastructure*

One of the factors that shape the educational development of a state is availability of educational institutions and access to education.

#### *2.1a School Education*

There is a remarkable progress in terms of availability of educational institutions including all levels of school (primary to higher secondary) education in the state. Till 1990s there was an inadequacy but there was unprecedented growth in number of institutions during 1990s owing to implementation of DPEP and later SSA programmes in the state. Subsequently the number of schools/colleges available for primary, middle, lower secondary and higher secondary (intermediate) level classes increased to around 84, 35, 17 and 4 thousands respectively in 2007-08.

**Table 2.1: School Infrastructure in Andhra Pradesh, 2007/8**

| Sno | Parameter/indicator | Number | | Per lakh pop | | Per 100 Sq Km GA | |
|---|---|---|---|---|---|---|---|
| | | AP | India | AP | India | AP | India |
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** | ***7*** | ***8*** |
| 1 | Number of schools with primary classes | 83872 | 1059083 | 102 | 93 | 30 | 32 |
| 2 | Number of schools with middle classes | 35097 | 438532 | 43 | 39 | 13 | 13 |
| 3 | Number of high schools | 17066 | 112834 | 21 | 10 | 6 | 3 |
| 4 | Higher Secondary/Junior colleges | 4264 | 59166 | 5 | 5 | 2 | 2 |

**Note**: 1. Includes both the private and public schools; 2. pop – Population; GA – Geographical Area.

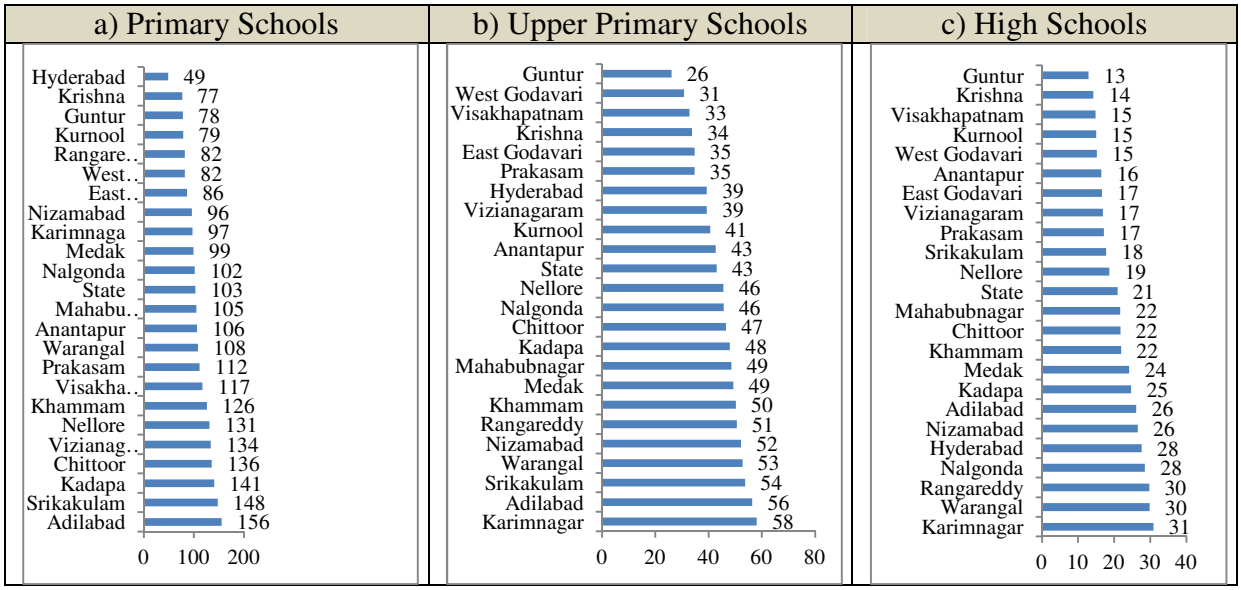
**Source**: 1. DISE; 2. DES (2009).

The coverage of these institutions in terms of population indicates there are 102 schools with primary level classes per lakh population in the state. Similarly there are 43, 21 and 5 schools

respectively with middle, lower secondary and higher secondary (intermediate) level classes per lakh population in the state (Table 2.1). In terms of geographical coverage, there are 30, 13, 6, and 2 schools respectively with primary, middle, lower secondary and higher secondary (intermediate) level classes per lakh population. When compared with all-India average, the state is relatively better in terms of institutions coverage of population – i.e. more number of institutions available per lakh population.

Across districts there is wide variation in number of primary school available per lakh population; it ranges from the highest 156 schools to the lowest 49 (Figure 2.1a). It is the highest in Adilabad district followed by Srikakulam, Kadapa, Chittoor, and Vizianagaram; and the lowest is in Hyderabad district followed by Krishna, Guntur, Kurnool and Rangareddy.

**Figure 2.1: Number of Primary/Middle/High Schools per lakh Population across District in AP, 2007-08**




**Source**: DISE.

It is to be noted that the indicator of number of schools available per lakh population hides the facts more than it reveals, because access to school depends upon the availability of the distance to nearest school place. Herein the density of the population is an important factors. For instance, even if the size of the population of two regions remains the same the number of schools required depends up on the density of population in these regions wherein the sparsely populated regions require more number of schools than thickly populated one.

In case of upper primary schools, the number of schools available per lakh population varies across districts between the highest 58 to the lowest 26 schools (Figure 2.1b). It is the highest in Karimnagar district followed by Adilabad, Srikakulam, Warangal, and Nizamabad; and the lowest is in Guntur district followed by West Godavari, Visakhapatnam, Krishna and East Godavari.

Similarly the number of high schools available per lakh population varies across districts between the highest 31 to the lowest 13 schools (Figure 2.1c). It is the highest in Karimnagar district followed by Warangal, Rangareddy, Nalgonda and Hyderabad; and the lowest is in Guntur district followed by Krishna, Visakhapatnam, Kurnool and West Godavari.

*4.2.1b Higher/Technical Education*

In the emerging knowledge based economies, development of human resources with educational levels beyond schooling are essential. With respect to higher education including professional, technical and vocational education, the state has shown a remarkable progress. The 1990s was the watershed point in terms of the growth of number of institutions available for higher education. Thereafter to till date there is rapid growth in number of institutions. In 2007-08 there are 420 degree colleges, about 30 universities, around 500 engineering colleges, 10 medical colleges and 100 pharmacy colleges in the state (Table 2.2). Besides there are number of polytechnic, business management and other training institutes in the state. The state is having higher number of engineering colleges than degree colleges. The strength of the state is intake and outgoing professionals out of these higher educational institutes.

**Table 2.2: Higher Education Institutes in Andhra Pradesh, 2007/8**

| Sno | Parameter/indicator | Number | | Per 10 M pop | | Per lakh Sq Km GA | |
|---|---|---|---|---|---|---|---|
| | | AP | India | AP | India | AP | India |
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** | ***7*** | ***8*** |
| 1 | Number of Degree Colleges | 420 | 11698 | 51 | 103 | 153 | 356 |
| 2 | Number of Universities | 28 | 337 | 3 | 3 | 10 | 10 |
| 3 | Number Engineering Colleges | 500 | 1562* | 61 | 14 | 182 | 48 |
| 4 | Number of Medical Colleges | 25 | 2063 | 3 | 18 | 9 | 63 |
| 5 | Number of Pharmacy Colleges | 84 | - | 10 | - | 31 | - |

**Note**: * - Government Engineering Colleges only.

**Source**: 1. DES (2009); 2. APSHE; 3. MHRD.

The coverage of these higher institutions in terms of population indicates there are 51 degree college, 3 universities, 61 engineering, 3 medical and 10 pharmacy colleges per 10 million population in the state (Table 2.2). In terms of geographical coverage there are 153 degree

college, 10 universities, 182 engineering, 9 medical and 31 pharmacy colleges per lakhs Sq. Kms of geographical area of the state. When compared with all-India average in terms of coverage, the state is relatively better in terms of engineering colleges only, for the other institutions the is having lesser number of institutions per 10 M population.

### *2.2 Health Care Institutions*

Unless a person leads a healthy life the choices/options/opportunities available for him/her is not so much valuable as compared that of those who lead healthy life. In this respect the access to health care especially public health care facilities play important role in improving the health conditions of people.

*4.2.2a Availability of Health Centres/Hospitals*

According to Facility Survey of Public Health Institutions conducted in 2008 there are 11978 Primary Health Sub-centres (PHSCs), 1458 Primary Health Centres (PHCs), 254 Community Health Centres (CHCs), 61 Area Hospitals, 19 District Hospitals in the state (Table 2.3). Besides, there are number of private clinics and hospitals especially urban centres. The coverage of health facilities in terms of population, there are 1461 sub-centre, 178 PHCs, 31 CHCs, 7 Area Hospitals and 2 District Hospitals per 10 million population in the state.

**Table 2.3: Health Care Infrastructure in Andhra Pradesh, 2008**

| Sno | Parameter/indicator | Number | | Per 10 M pop | | Per lakh Sq Km GA | |
|---|---|---|---|---|---|---|---|
| | | AP | India | AP | India | AP | India |
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** | ***7*** | ***8*** |
| 1 | Number of Sub-Centres | 11978 | | 1461 | | 531 | |
| 2 | Number of PHCs | 1458 | | 178 | | 65 | |
| 3 | CHC(30-Beds) | 191 | | 31[#] | | 11[#] | |
| 4 | CHC(50-Beds) | 63 | | - | | - | |
| 5 | Area Hospital (100-Beds) | 61 | | 7 | | 3 | |
| 6 | District Hospital (200-300-Beds) | 15 | | 2[4] | | 1[4] | |
| 7 | District Hospital (300-400-Beds) | 4 | | - | | - | |
| Total | | 13770 | | 1679 | | 611 | |

**Note**: 1. # - CHCs combined; 4 - District hospitals combined.

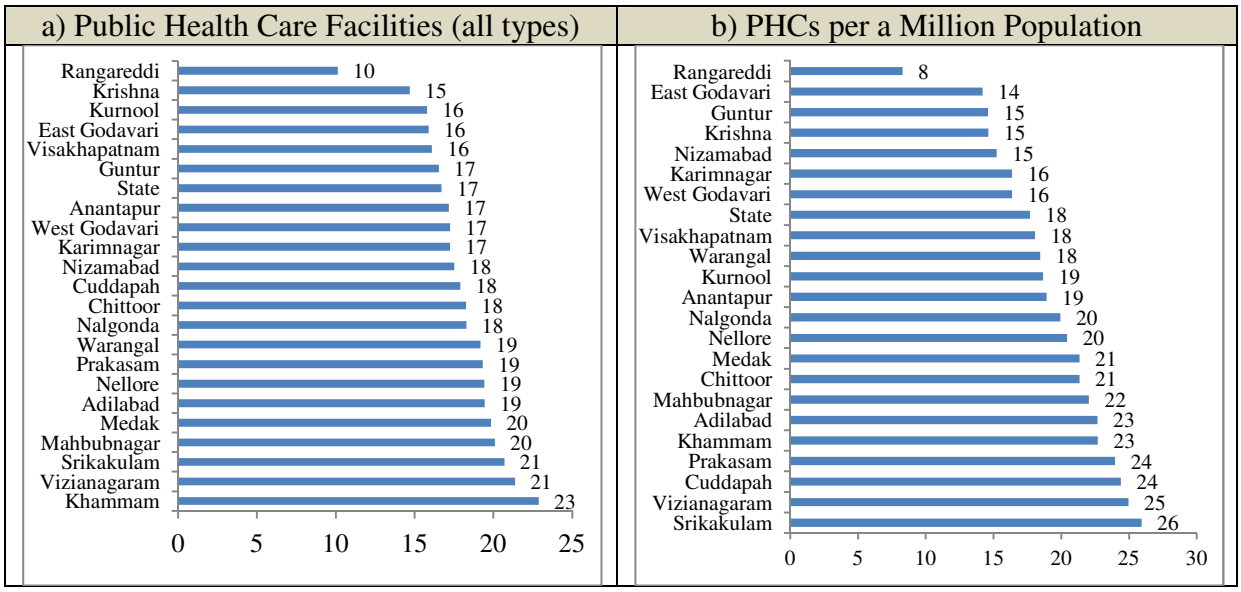
**Source**: 1. For Andhra Pradesh - ***Facility Survey of Public Health Institutions: 2008***, Indian Institute of Health and Family Welfare, Hyderabad; 2. For India – www.indiastat.com.

Conversely each sub-centre is covering, on an average, seven thousand population in the state. Similarly the coverage of population by the other levels of hospitals are: PHC 56 thousand population and CHC 3.3 lakhs Area Hospital 13.5 lakh and 43.2 lakh.

Across districts there is a wide variation in number of health care facilities (all types/categories of hospital) available per lakh population; it ranges from the highest 23 to

the lowest 10 health centres/hospitals (Figure 2.2a). It is the highest in Khammam district followed by Vizianagaram, Srikakulam, Mahabubnagar, and Medak; and the lowest is in Rangareddy district followed by Krishna, Kurnool, East Godavari and Visakhapatnam.

**Figure 2.2: Number of Public Health Care Facilities (all types of Hospital) per lakh Population across Districts in AP, 2008**




**Source**: Facility Survey of Public Health Institutions: 2008, Indian Institute of Health and Family Welfare, Hyderabad.

Whereas in the case of PHCs, variation in number of primary health centres (PHCs) available per a million population; it ranges from the highest 26 schools to the lowest 8 (Figure 2.2b). It is the highest in Srikakulam district followed by Vizianagaram, Kadapa, Prakasam and Khammam; and the lowest is in Rangareddy district followed by East Godavari, Guntur, Krishna and Nizamabad.

*2.2b Human Resource for the health care sector*

More than number of institutions, the professional and technical human resources available in the health care sector is important. The most recent report of WHO (2006) *The World Health Report 2006 - Working Together for Health* contains an expert assessment of the current crisis in the global health workforce and ambitious proposals to tackle it over the next ten years, starting immediately. The report concludes that there is an estimated shortage of almost 4.3 million health workers in the world. The shortage of health workers and their inefficiency in functioning, especially in the public sector health care system, is not a new phenomenon.

In India there are about 0.8 million doctors and 2600 dental surgeons (allopathic) serving its one billion population. It means on an average of one doctor per fourteen thousand people and one dental surgeon per four lakh people. The situation in Andhra Pradesh is better than the all-India average, with one doctor per 10 thousand people[2] but it is relatively poor when compared with other states, especially in south India.

Based on the NSS 61st (2004-05) round on Employment and Unemployment survey data it is estimated that there were 2.6 lakh health workers (including both public and private health care) comprising 0.65 per cent of the total workforce in Andhra Pradesh. On an average there were about 324 health workers engaged in health services per lakh population in the state. The share of the public sector in the total workforce engaged in providing services is almost same in the state and at the country level, 28 per cent. In terms of the availability of health workers (per lakh population) both in general and the public sector in particular, the situation of Andhra Pradesh (i.e. 324 and 95) seems better when compared to the all-India average (304 and 86).

The distribution of health workers by nature of activity shows that about 38 per cent are engaged in hospital related activates and another 30 per cent in medical and dental practices. About 5 per cent of the total health workers are engaged in the practice of traditional (Indian) systems of medicine. About 18 per cent of workers are engaged in nursing and other paramedical activities and those who engaged in independent diagnostic centres, pathology labs and blood banks constitute about 5 per cent of the health workers in the state. The proportion of health workers engaged in traditional (Indian) systems of medicine in the state is well below the national average and it can be concluded that the demand for such health services is very low in Andhra Pradesh.

Rural-urban differences are quite high both in Andhra Pradesh and at the national level. More health workers are located in urban areas than in rural areas. The availability of health workers and therefore health services is much better for the urban population as compared to the rural. Traditional (Indian) systems of medicine are also mostly practised in urban areas. In Andhra Pradesh only twenty per cent of the health workers are in the public sector which is well below the national average. There is also a large difference in the per capita availability

[2] There are 7991 doctors and 198 dental surgeons serving a population of 80 million in the state.

of health workers between rural and urban sectors, indicating the disadvantage of rural people in terms of access to health services in general and public health services in particular.

## III Summary

The state of Andhra Pradesh has shown tremendous progress in terms of economic and social infrastructure over a period of time especially during the last two decades. Nevertheless state has to continue to improve its infrastructure base in order to improve its status with respect to human and economic development. In economic infrastructure, road connectivity and transportation has improved but still there are villages in the state which do not have pucca road and any transportation facility. In terms of energy, although Andhra Pradesh stands top in terms power generation in India, it is not meeting the increasing demand for energy. The gap in supply and demand for the electricity is affecting the growth of industry and thereby by employment opportunities in the state. The development of Non-Conventional and Renewal Energy systems in the state is in the infancy stage. Access to formal financial institutions has improved but still inadequate and marginalised sections are not able get the formal credit so that they have to depend on the informal systems.

With respect to social infrastructure, most of the villages are having primary schools and middle and high schools available within the distances (norms). As regards the health facilities, there are adequate number of sub-centres and PHCs available in the state but their functioning is a matter of concern.

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