POLICY FRAMEWORK AND PREPAREDNESS

for Implementing Measures to Effectively Deal with Climate Change

An Analysis For The State Of Andhra Pradesh

A study titled "Policy Framework and Preparedness for Implementing Measures to Effectively Deal with Climate Change: An Analysis of four states in India" was conducted through the support of the Heinrich Böll Foundation, India.[1] The objective of the study was to assess climate change vulnerability of four states namely, Andhra Pradesh, Goa, Karnataka and Tamil Nadu. The aim of the study was also to understand the implications of the predicted Climate Vulnerability and Mitigation potential under various scenarios generated under the Intergovernmental Panel on Climate Change (IPCC) from the states' perspective.

Further, a detailed gap analysis was done to understand which actions, interventions, and solutions mentioned under the State Action Plan on Climate Change (SAPCC) (mandated under Ministry of Environment, Forest and Climate Change (MoEFCC) were aligned with the IPCC AR5 report.[2]

This pull out comprises of findings for the state of Andhra Pradesh. It also lists out common recommendations that have emerged from the study. It has been prepared to initiate the discussions at the state level, on the status of the implementation of their climate change action plans.

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ANDHRA PRADESH State Profile

Energy Profile

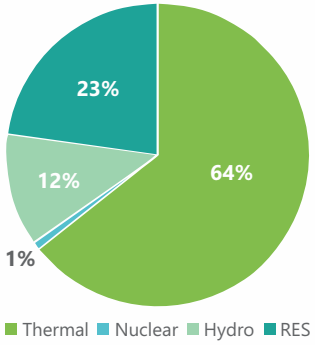
Prior to the division of Andhra Pradesh and Telangana (the handout is based on information prior to the division of erstwhile Andhra Pradesh into the two states of Telangana and Andhra Pradesh). The state accounted for an average annual Gross State Domestic Product (GSDP) growth at 7.25% between 2004-05 and 2012-13.[3] In 2012- 13, the service sector contributed 55.3% to the GSDP (at constant prices). The agriculture and industry sectors contributed to 23.1% and 21.5% respectively.[4]

During 2004 to 2012, Irrigation Potential of 20.90 Lakh[5] acres has been developed through various major and medium projects. Scheme such as, Modernization of Delta Systems, Accelerated Irrigation Benefit Programme etc, have bolstered the irrigation infrastructure.

For the rural development sector, focus has been placed on watershed development, land development and wage employment programs.[6] The power sector has seen improvement in reduction of interruptions in supply as well as a fall in the transmission and distribution losses[7] through improved infrastructure pertaining to the sector and introduction of schemes such as Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) for the rural areas.

This pull out comprises of the major findings for the state of Andhra Pradesh (prior to bifurcation into Telangana and Andhra Pradesh). It delves into the capacity and potential of the state to address the issues of climate change along with other related vulnerabilities. As mentioned, we are primarily focused on looking at two broad parameters - Energy profile and Vulnerability and Impacts profile of the state.

Installed capacity of power utilities in Andhra Pradesh as on 31st May 2017 stands at 33799.58 MW of which 22298.3 MW is from Andhra Pradesh and 11501.28 MW from current Telangana state.

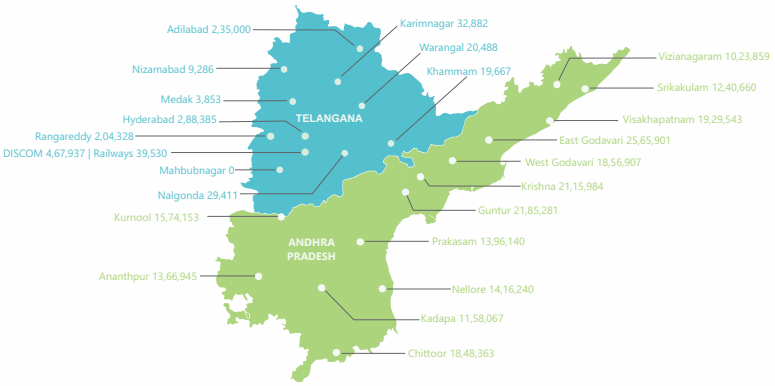


Energy Generation Profile
Andhra Pradesh

Of the total installed capacity, 64% of the electricity produced is through thermal sources using coal, gas or diesel. Hydroelectric energy accounts for 12%, other renewable energy is 23% and nuclear energy accounts for 1 % of the total installed capacity, respectively.

To address the growing demand for energy without burdening the natural resources, Andhra Pradesh and Telangana are taking initiative for sustainable energy generation.

To increase energy access in the rural areas, the state is implementing the Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY). The national UJALA scheme is also being implemented to promote efficient use of energy at the residential level by reducing costs and promoting higher uptake of LED lights.



Total LEDs distributed in Andhra Pradesh & Telangana - 23028616

National Ujala Dashboard, as accessed on July 14, 2017

Andhra Pradesh also framed the new Solar Policy 2015. It is the first state to adopt the Energy Conservation Building Code for all new commercial buildings. It will also establish a 10-Megawatt (MW) Canal Top Solar PV Plant on Dharmavaram Canal at Anathapuram.

Vulnerability and Impacts

The vulnerability and impacts profile for Andhra Pradesh is based on the climate change impacts on the state. Focusing on parameters such as rainfall patterns and variation from mean precipitation levels. Occurrence of natural disasters like drought and cyclone have been factored in among other parameters. Groundwater availability is also taken as parameter to assess potential vulnerability for states due to inadequate groundwater replenishment and high extraction.

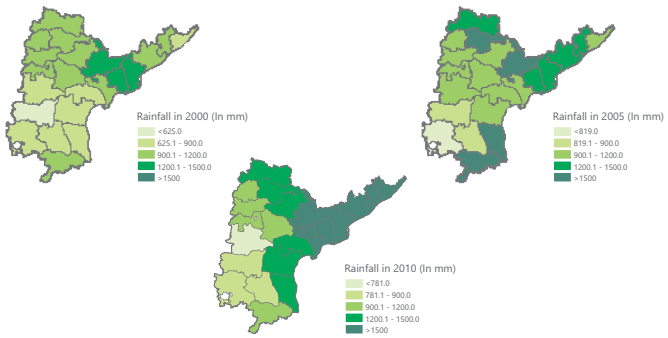
Data sources for the Report -

The data has been collected for each of the parameters – rainfall data, drought, cyclone and ground water. Vulnerability maps have been prepared on these parameters to have a perspective of the most vulnerable districts for these Indian States. The maps have been made using Arc GIS and Quantum GIS software. The data has been mapped in different points of time to show the progressive changes in the vulnerabilities of the states.

Indicator	Data Source	Time Series
Rainfall fluctuations	IMD	2000-2010
Cyclones	IMD	1891-2008
Droughts	IMD	2002-2014
Ground Water Stress	CGWB	2010-2050 (Projections)

Rainfall Pattern

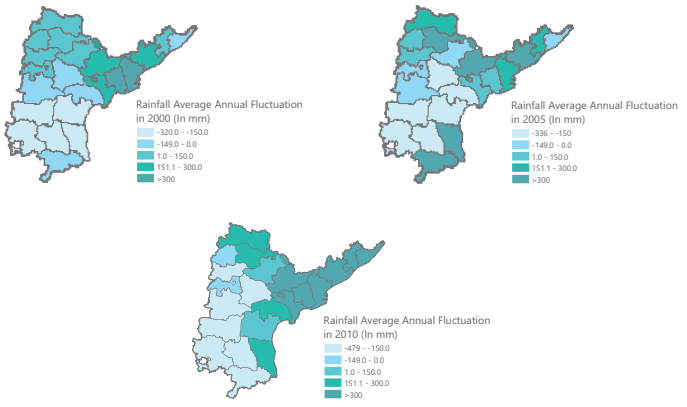
Coastal districts of Andhra Pradesh received a relatively higher amount of precipitation between 2000 to 2010. This has been consistently increasing over the years. The southern districts of the state have witnessed an oscillating trend (high precipitation in 2005 and low in 2000 and 2010). While, northern coastal region has been consistently receiving increased rainfall over the 2000-10 decade.



Rainfall Pattern of Andhra Pradesh

Rainfall Variation

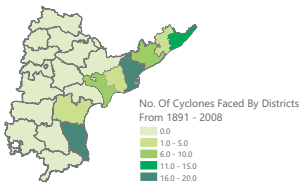
The rainfall variation (from the mean)showed a varied pattern of inconsistencies within districts. High altitude, inland districts received considerable amount of rainfall above mean in 2010 as opposed to 2000 and 2005, thus the rainfall variation is high. Data for the year 2010, depicts that eight districts (including coastal districts) received rainfall higher than the state average of 1260.3 mm, while seven districts received precipitation below state average. Over the 2000-10 decade, three districts – Anantapur, Kuddapah and Kurnool have been in the lowest rainfall category, making their ecosystem vulnerable to negative impacts.



Rainfall Variation In Districts Of Andhra Pradesh

Cyclone

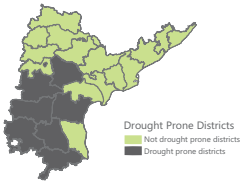
The existing geology and climate of Andhra Pradesh, exposes it to a diverse range of disasters such as cyclones, storms, floods and droughts. The entire east coastline of Tamil Nadu, Andhra Pradesh, Odisha and West Bengal is prone to cyclone hazards.[8] Most of the coastal districts have been impacted by cyclones in the past years. Two districts – East Godavari and Nellore have been affected 17-18 times. Severe cyclones have caused destruction amounting to thousands of crores. Cyclone Hudhud which hit Andhra Pradesh in October 2014, impacted three districts of Visakhapatnam, Srikakulam and Vijayanagaram.[9] The initial estimate of the losses caused by Cyclone Hudhud was 70,000 crores. While the population affected was estimated to be 9,200,00, mostly in Vishakhapatnam and Vizianagaram, districts. This was due to damage to crops on 450,000 acres agricultural land, infrastructure, loss of assets and damage to property.[10]



Cyclone Affected Districts Of Andhra Pradesh

Drought

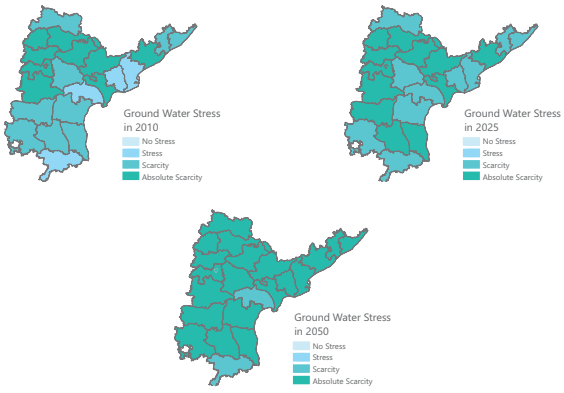
About 35% districts in Andhra Pradesh are prone to droughts and are situated in the southern and central parts of the state. The drought prone areas have been identified and constructed through ArcGIS.



Drought Prone Districts In Andhra Pradesh

Ground Water

As mentioned earlier, groundwater availability is a serious concern in terms of assessing vulnerability of a region. Hence, ground water is addressed as a parameter for vulnerability. According to 2050 projections by the Central Ground Water Board (CGWB), districts categorised as "no stress" in 2010 are likely to experience extreme groundwater stress. In 2010, nine out of 23 districts were identified as water scarce. As per the 2050 projections, except Chitoor and Guntur, almost all districts are predicted to be under absolute groundwater stress.



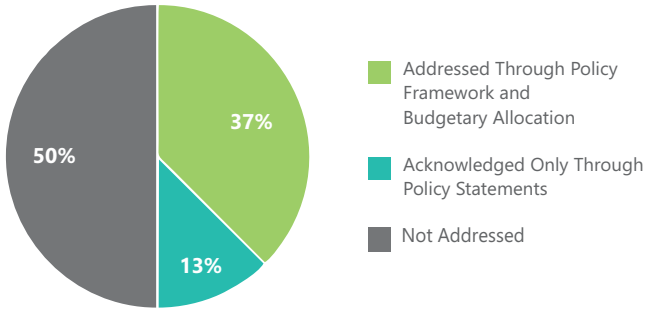
Groundwater Stress In Andhra Pradesh

Based on the above mentioned parameters, i.e. variable rainfall pattern and vulnerability to natural disasters it can be ascertained that Andhra Pradesh is highly vulnerable to climate change. Rainfall variability has implication on agriculture and water. While, cyclone threaten the coastal ecosystem. And have a negative impact on state's infrastructure, risk to human lives, moveable and immovable assets. Drought affects the agricultural production of the state, which in turn impacts livelihood majority of the population.

Gaps & Status of Preparedness

Climate Resilient Agriculture | Climate Resilient Ecosystem | Social Adaptation | Climate Resilient Infrastructure | Sustainable Water Management | Energy | Sustainable Smart Cities

This section looks at the Andhra Pradesh's state of preparedness with respect to seven categories mentioned above. The recommendations for each of these categories are based on references from IPCC AR5 report, the New Climate Economy report[11] (NCE) and the State Action Plan on Climate Change for Andhra Pradesh.[12]



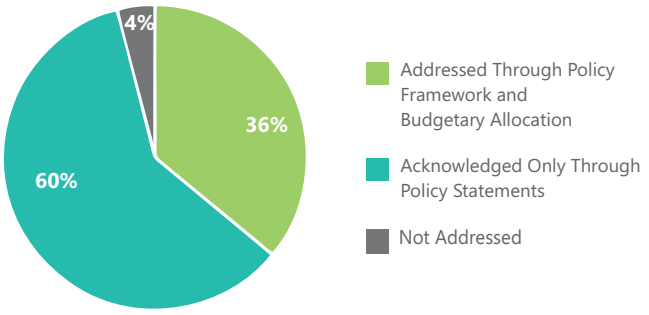
Recommendations Addressed Through Climate Resilient Agriculture In Andhra Pradesh

Climate Resilient Agriculture

As per the recommendations under the IPCC AR5, NCE and SAPCC for Andhra Pradesh (A.P.), 37% of the said recommendations are addressed with budgetary allocation, which include efficient irrigation and water saving technologies. The state funding initiative to replace one lakh agricultural pumps with energy efficient ones is a step towards promoting energy efficiency in water pumps. Around 13% have been taken cognizance off but are not supported through budgetary allocation. While 50% of these recommendations remain unaddressed. Larger governance issues such as reallocation of funds from low yielding subsidies to public support for farmers are not adequately addressed by the state.

Climate Resilient Ecosystem

Andhra Pradesh's (A.P.) SAPCC has identified forest and biodiversity as a separate category for addressing the impacts of climate change. As per the IPCC recommendations, climate resilient ecosystem category focuses on concerns of forest, biodiversity and coastal zone management issues. Around 60% state recommendations have been acknowledged through policy statements, which include A.P.'s forest policy for provision of protected areas Afforestation and eco-development through community based programmes (JFM), and state Forest Department's forest management initiative and Eucalyptus clone plantations. This category has both adaptation and mitigation oriented benefits. Andhra Pradesh Hazard Mitigation Project and Andhra Pradesh Disaster Recovery Project address Coastal Zone Management concerns related to natural disasters like cyclones.

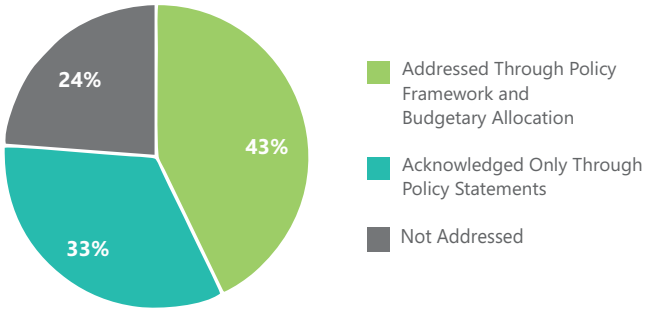


Recommendations Addressed Through Climate Resilient Ecosystem In Andhra Pradesh

While, funding for soil and water conservation Neeru Chetu Programme worth 640 crores, Andhra Pradesh Community Based Tank Management Project receive funding from the state. These budgetary allocation address 36% of the recommendations as under IPCC. Around 4% recommendations under this category, go unaddressed which include strong regulatory governance and project selection mechanisms, payment for ecosystem services (PES).

Social Adaptation

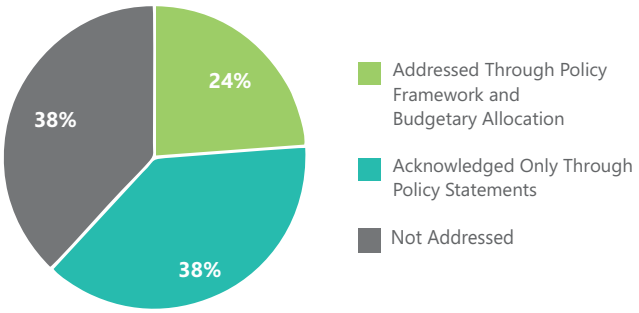
As per the IPCC recommendations the issues covered under social adaptation include gender equality, education and poverty alleviation. But social adaptation in the state mainly covers health sector. About 43% of IPCC recommendations are being addressed through state budgetary allocation for improvement of health, education and poverty reduction through Polampilusthondhi Scheme, AYUSH Grama Yojane, providing quality education in Madarasas. Another 33% of the IPCC recommendations have been acknowledged through policy statements. These include research on development of low cost vaccines, especially those related to vector borne diseases. The National Vaccine Policy mandates low profit margins to produce low cost vaccines. Also, Health Surveillance has been addressed through the Integrated Disease Surveillance Programme (IDSP) under the Ministry of Health & Family Welfare, Government of India. But we are not aware of budgetary allocation to deal with these aspects. Remaining 24% recommendations are unaddressed.



Recommendation Addressed Through Social Adaptation In Andhra Pradesh

Climate Resilient Infrastructure

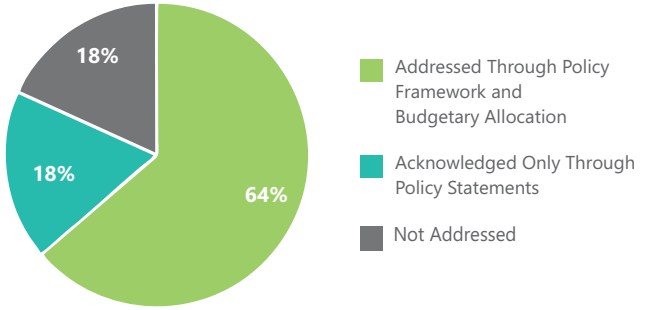
Around 24% of IPCC recommendations towards building climate resilient infrastructure have been acknowledged and addressed through budgetary allocations. These include, recommendations for upgrading urban infrastructure (scale and quantity), building for flood and cyclone shelters. Another 38% recommendations have been recognized through policies and schemes with no specific funding. Such as, Andhra Pradesh Building Rules, 2012, (under AP Regulation of Buildings Act) which provides building codes and practices to reduce structural damages. But even with these in place 38% of the IPCC recommendations still go unaddressed.



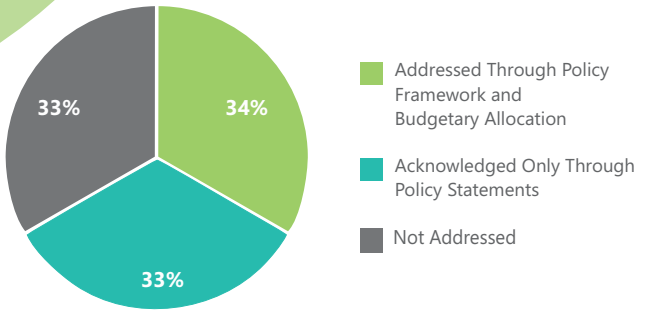
Recommendation Addressed Through Climate Resilient Infrastructure In Andhra Pradesh

Sustainable Water Management

The Neeru Chettu Programme, Andhra Pradesh Water Sector Improvement Project addresses 64% of the IPCC recommendations for integrated water resource management, better water storage, soil and water conservation, with funding provisions through an allocated budget. 18% recommendations have been acknowledged as under state and national policy measures, but with no funds allocated for these. Another 18% recommendations under IPCC, such as diversifying water resources etc. remain unaddressed.



Recommendation Addressed Through Sustainable Water Management In Andhra Pradesh



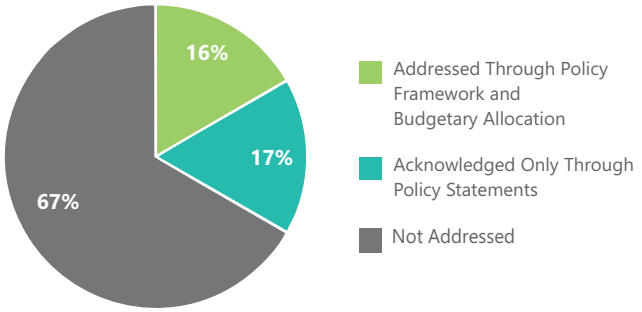
Recommendation Addressed Through Energy In Andhra Pradesh

Energy

The IPCC and NCE recommendations for the energy sector includes energy efficiency and promotion of renewable energy. Around 34% of these recommendations have been addressed in the state, through policies and schemes as including budgetary support. These include recommendation for improved energy efficiency by reducing the proportion of coal in country's fuel mix by adding two Solar Parks of 1000 MegaWatt (MW) each in Anantapuram and Kurnool. The state has also taken initiative to promote affordable alternative energy sources (solar home systems, solar street lights etc.) through National Ujala Scheme. 33% of the remaining IPCC and NCE recommendations are taken cognizance through policy provision of the state. However, another 33% remain unaddressed.

Sustainable Smart Cities

Andhra Pradesh does not address 67% of the IPCC and NCE recommendations. These include reforms to achieve more compact, productive and green cities, rent control laws (reform), better systems of appraise land value and determine property rights have not been recognized by the states. While 17% recommendations have been acknowledged through policy measures such as the National Urban Housing and Habitat Policy, 2007 and Revised Building Rules 2006. 16% has been addressed through policy and budgetary support.



Recommendation Addressed Through Smart And Sustainable Cities In Andhra Pradesh

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RECOMMENDATIONS

The following recommendations have been based on the study of four states - Andhra Pradesh (including Telangana), Goa, Karnataka and Tamil Nadu. The recommendations are common to all the states addressed in this study.

It is further based on the review of the seven categories in the four states. Some issues /areas need to be addressed for states to enhance their capacities and preparedness to address climate change. The following recommendation are placed for concrete action for successful implementation of the respective State Action Plans on Climate Change.

This becomes important in context of the Paris Agreement being ratified in 2015. Under which, countries across the globe are required to be proactive in issuing policies and programs to ensure effective implementation of the Agreement.

Within the Indian context, implementation of the Paris Agreement requires national and state governments to formulate policies and programmes to address climate change and ensure compliance of targets.

The recommendations are as follows -

- **Long-Term Development Vision:** Andhra Pradesh needs to develop a long term 'Development Vision' which factors in challenges and risks emanating due to climate change
- **Road Map for Implementation:** following in line with the 'Development Vision' the state needs to develop an implementation road map with milestones and targets.
- **Institutional and Governance Structures:** to ensure holistic and integrated development planning and implementation of institutional and governance structures ought to be in place. As opposed to current pattern of planning and implementation of programmes and policies that are in silos.
- **Adequate Financing:** state ought to ensure that adequate financing is available for integrated development. Current budget allocation is based on departmental/ ministerial budgets.
- **Capacity Building and Training:** the states has a penchant for pursuing hard technological solutions to address climate change. But soft skills and capacities that are required to address climate change, tend to remain unaddressed. For example, adequate focus on capacity building, training, information sharing, creating repositories of good practices etc.
- **Context Relevant Solutions:** states seem to be going for solutions which are often tried and tested without delving into see whether these solutions continue to be appropriate with changing times and situations. For example, a couple of decades back, coal was perhaps the most viable source of electricity, while in today's world, renewable energy has proved to be more viable source of electricity. But states, continue to pursue options of generating electricity from coal, despite this.
- **State-Centre Linkages:** the Central Government needs to ensure that States are kept abreast of developments at international climate negotiations at various forums including the United Nations Framework Convention on Climate Change (UNFCCC) from time to time.
- **Specific Institutional Arrangements at State Level:** states need to create specific institutional arrangements that can enable them to meaningfully assist the Central Government in meeting its reporting and other obligations to the UNFCCC and its governance arrangements.

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