



Inception Report for Industrial Areas of Andhra Pradesh & Telangana

Understanding Capacity Needs Requirements for Different Stakeholders of Climate Change Adaptation for Industrial Areas of Andhra Pradesh & Telangana

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List of Abbreviations

CCA	Climate Change Adaptation
GIZ	Gesellschaft für Internationale Zusammenarbeit
APIIC	Andhra Pradesh Industrial Infrastructure Corporation
TSIIIC	Telangana State Industrial Infrastructure Corporation
CNA	Capacity Needs Assessment
CE	Chief Engineer
GM	General Manager
P & A	Personnel and Administration
LAC	Local Authority
CGM	Chief General Manager
AM	Asset Management
EO	Executive Officer
O & M	Operations and Maintenance
FTAPCCI	The Federation of Telangana and Andhra Pradesh Chambers of Commerce and Industry

1. Introduction

The Climate Change Adaptation (CCA) Project for Industrial Areas of Andhra Pradesh and Telangana States assisted by the German Government and is being carried out by INTEGRATION Environment and Energy GmbH, Adelphi Consult and Ifanos Concept & Planning of Germany on behalf of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. This project has financial commitment from the German Federal Ministry of Economic Cooperation and Development (BMZ) for a 3 year period commencing from April 2015 and ending in April 2018.

APIIC and TSIIIC are state level industrial infrastructure development agencies for identifying and developing potential growth centres and industrial parks with developed plots/sheds, roads, drainage, water, power and other infrastructural facilities in their respective states. There are about 257 industrial parks in Andhra Pradesh spread over 13 districts, similarly in Telangana there are 118 IPs spread over 10 districts.

This CCA Project will help taking measures proactively to adapt to Climate Change and overcome the associated negative impacts and risks for continuation of business by industries and industrial parks. The project will also help developing methods and tools, plans for climate-resilient industrial area development and implement the measures on pilot basis in selected existing and new Industrial Parks in the states of Andhra Pradesh and Telangana.

The responsibilities and the tasks of the Climate Change Adaptation Project are to advice, train and motivate the target groups so they contribute to an industrial development more resilient to climate change. One of the Work Packages of CCA project corresponds to “Awareness Raising and Capacity Building”, where key outcomes are to develop three modular training programmes based on the methodologies and approaches developed under the project for the following topics:

- Climate Risk Analysis and Management
- Climate Resilient Planning New Industrial Parks and Retrofitting of Existing Parks
- Implementation of Climate Resilient Measures

It is envisaged to develop a professional profile “Climate Safety Officer”. The three courses shall cover the required training to achieve the certification.

In this regard, to understand the needs of capacity development for different stakeholders on policy, technical, regulatory, financial, planning and implementation, managerial and organizational and other processes, INTEGRATION has engaged the services of Administrative Staff College of India for carrying out “Capacity Need Assessment Studies”.

2. Preparatory Work

ASCI has begun work on the project, several meetings (8 meetings: 6 regular and 2 SKYPE) have been conducted with key persons in the project to understand various components of the project.

The following tasks have been completed:

1. Identification of the key resource people at ASCI – Dr. Narendran Kodandapani, Associate Professor, Environment Area and Mr. G. Bala Subramanyam, Advisor, Environment
2. A stakeholder landscape has been prepared (Please see annexure 1).
3. A stakeholder profile has been prepared for each stakeholder group, their current responsibilities, roles, with respect to CC adaptation.
4. Stakeholder groups include APIIC/TSIIC at head office and zonal offices, IALAs, related government departments such as Town Planning, State Pollution Control Board and others. Industry include top management (CEOs, GMs) and middle level management (environmental officer/safety officer/ managers), and association representatives.
5. A joint meeting was held with INTEGRATION and Core CarbonX on designing the interview questions and also to coordinate activities in the project and also to understand their questionnaire and not duplicate information.
6. A preparatory meeting and a follow up meeting has been conducted in the Cherlapally IDA on stakeholder perceptions on climate change adaptation and capacity needs on 21/12/2015 and 8/1/2016 respectively.
7. An interview question has been finalized after approval by Dr. Brulez and Dr. Peter Bank.
8. Based on the following two documents provided to ASCI, two IPs in Telangana and Two IPs Andhra Pradesh have been selected for the detailed Capacity Needs Assessment
 - a. A strategy outline for the implementation of the “Climate Change Adaptation Project (CCA)” in industrial areas of AP and Telangana, India.
 - b. Preliminary screening of industrial parks of Telangana: Jointly prepared by CoreCarbonX and Integration.

3. Preliminary Screening of Industrial Parks in Telangana and Andhra Pradesh

INTEGRATION and CORE CARBONX prepared a report on “Preliminary Screening of IPs” as a part of the study on baselining and selection of IPs for interaction for CCA project in the state of Andhra Pradesh and Telangana States. The following criteria were considered for ranking the IPs for the study:

Criterion 1 – Exposure of existing Industrial Parks to Climatic Changes

Criterion 2 – Capacity and Capability to Implement Climate Change Adaptation

Criterion 3 – Representativeness of IP

Based on the study the INTEGRATION and CORE CARBONX had arrived overall and section wise scoring and ranking of IPs in Telangana State. Similar information for the IPs located in Andhra Pradesh have been obtained vide Lr.No.202/APIIC/EMP/CCA in IP's/2013-14 dated 11/12/2015 and INTEGRATION vide mail dated 14, December, 2015 communicated the top five ranked IPs located in AP and TS and revised by TSIIC/APIIC as follows:

IPs in Telangana:

1. IP Pashamaylaram
2. IP Jeedimetla
3. IP Manikonda & Hitech City Madhapur & Software Units Layout (IP Manikonda, Hi tech city Madhapur and software unit layout Madhapur are adjacent to each other).
4. IP Cherlapally.
5. IP Rampur and Madikonda

IPs in Andhra Pradesh:

1. IP Kakinada(Phase II & III)
2. GC Ongole
3. IP Kurnool
4. AN Gajuwaka, Visakhapatnam
5. GC Bobbili

4. Selection of IPs for the Capacity Needs Assessment

ASCI Team reviewed the available study reports and selected two IPs in Telangana and two IPs in AP, as per the scope of the project for the Capacity Needs Assessment study.

The criteria used for ranking and selecting the IPs in the two states:

- i) The exposure of existing IPs to climatic changes, especially extreme climatic conditions in the recent times such as severe cyclones, droughts etc.
- ii) Ranking of IPs done by INTEGRATION and Core CarbonX
- iii) Industries located in the IPs

5. Results

Based on the interactions and reports shared to ASCI, the various stakeholders have been identified. The most important stakeholders identified are the APIIC/TSIC officials in the head offices in Hyderabad. Another group of stakeholders are the IALA officials and the contractors, and finally the third group of stakeholders are the various industries and the industry associations. A detailed list of the various stakeholders and their current profiles/responsibilities under CCA has been prepared and is given in annexure 1. A detailed questionnaire has been prepared to assess the current gaps in Climate Change Adaptation for the various stakeholders and their needs to fulfil their roles effectively under CCA.

Table 1: Selected IPs for CNA analysis and the distribution of hazards, industry types and rationale for selection of the IPs

Sl. No.	IP	State	Climatic Hazards	Industries	Remarks
1	Jeedimetla	Telangana	Heat waves; Increasing temperature trend;	Automotive based industries, general engineering, steel re rolling, R & D of biotech, pharmaceuticals, chemicals, paints, pesticides	Jeedimetla would be a representative sample of different types of industries, hence capacity development needs of a diversity of stakeholders would be captured
2	Hitech city, Madhapur	Telangana	Heat waves; Increasing temperature trend;	IT & ITeS (Information Technology & Information technology enabled services	Several IPs across the country are for IT & ITeS, inclusion of Hitech city, would provide capacity needs for this substantial revenue generating industry type
3	AN Gajuwaka, Visakhapatnam	AP	Cyclones, storms, flooding events	Automotive based industries Manufacturing General engineering	The inclusion of this IP would provide insights into capacity needs of industries vulnerable to cycles, floods

4	IP Ongole	AP	Droughts, increasing temperature trends	General engineering; Granite based industries, manufacturing	The inclusion of this IP for the capacity needs assessment would provide information on drought vulnerable industrial units
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In Telangana we have selected two IPs, Jeedimetla and Hitech city, Madhapur. This sample from Telangana covers industries ranging from pharmaceutical to information technology. In addition, these two IPs experience a range of climatic hazards such as heat waves, droughts, and other disasters and hence assessing CNA for various stakeholders will capture different issues related to climate change adaptation.

In AP we have selected two IPs, AN Gajuwaka, and Ongole. This sample from AP covers industries ranging from automobiles to agri based industries. In addition these two IPs experience a range of climatic hazards such as cyclones, storms, droughts, and heat waves and hence assessing CNA for various stakeholders will capture difference issues related to climate change adaptation in the state of AP. Further in recent times, AN Gajuwaka has faced extreme climatic events such the cyclones and storms, for example, Hud-hud.

6. Schedule for Stakeholder Consultation

The following schedule is suggested for doing the stake holder consultation:

Sl. No.	IP	Date of visit
1.	Hitech city Madhapur	18/1/2016
2.	Jeedimetla	19/1/2016
3.	Gajuwaka	23/1/2016
4.	Ongole	01/02/2016

Note: The above dates have been arrived at based on the suggestions made by the APIIC/TSIC in consultation with INTEGRATION and also to facilitate mobilization of stakeholders for the joint meetings conducted by Core CarbonX and ASCI.

In addition, ASCI along with INTEGRATION has planned for interaction with Andhra Pradesh State Level Environmental Appraisal Authority; a key stakeholder in the environmental appraisal for IPs and for certain industries under the provisions of EIA Notification, 2006 on 22nd January 2016 at Visakhapatnam.

It is suggested to have round table discussion with the senior leadership of TSIC and APIIC officers in February 2016 at Administrative Staff College of India and INTEGRATION may kindly coordinate with the concerned. It is also proposed to invite the related government departments also for the round table discussions.

7. Stake Holder Landscape Mapping

The Stakeholder mapping is given in **Annexure 1**. A stakeholder mapping for the CNA study revealed that the important groups important are the APIIC/TSIIC officials in the head office; another group of stakeholders are the IALA officials and agencies responsible for the day to day functioning of the industrial parks; the industry/entrepreneurs and associations; and finally various state government agencies that are responsible for framing policies with regard to industries in the states such as the pollution control boards, industry departments, and other departments. Currently most of these stakeholders either have a cursory understanding of climate change and how it would impact industries.

8. Stakeholder focal interview

The draft questionnaire was shared with INTEGRATION and duly incorporating the inputs received from them, the final questionnaire is prepared and the same is attached as **Annexure 2**. A customised questionnaire has been prepared for the stakeholder group APIIC/TSIIC officials of the head offices and is given in **Annexure 3**.

Annexure 1

Stakeholder landscape

S. No.	Stakeholder	Role/existing	Key actor
TSIIC/APIIC Head Offices			
1	Chief Engineer	Planning and execution of water, power, roads, layout infra, wastewater, solid waste	Key
2	General Manager (Personnel and Administration)	Prepare training needs	Key
3	General Manager (Local Authority)	Property tax, building plans, civic amenities	Key
4	General Manager (MIS)	IT, Statistics, Information	Key
5	Chief General Manager Finance	Allocation of funds, Insurance, relief assistance	Key
6	Chief General Manager (Asset Management)	Manage assets	Key
7	General Manager - Law	Framing rules	Key
8	Chief General Manager (IA)	General Administration	Key
9	Zonal Manager	Review, advise, supervise, guide overall function of IALA	Key
10	Commissioner/EO and related officials	All matters in the IALA; approval authority; maintain reports; records	Key
11	Operations and Maintenance Agencies	Maintenance of facilities in IPs	Primary
12	Service Society	Advisory body to IPs	Primary
13	Senior Management	CEO of industries, MDs, owners of the industries who manage industries	Primary
14	Middle Management	Manage the day to day activities of industry	Primary
15	IP Associations	Agencies advocate favorable policies at IALA	Primary

16	FTAPCCI and other associations	Agencies advocate favorable policies statewide	Primary
State Governments			
17	Department Heads (Industries, Disaster Management, Finance, Environment, Planning, Agriculture, Irrigation)	Creation of overall policy framework	Secondary
18	SPCB	Issuing consent to establish and operate to IPs and industries and enforce the environmental norms for compliance through inspections and monitoring	Primary
19	Planning Department	Planning for the future in overall development of the state	Primary

Annexure 2

Focal interview questions jointly prepared by INTEGRATION / ASCI

1. **What is your awareness and knowledge of CC such as?**
 - a. Gradual increasing concentrations of GHGs since industrial revolution
 - b. Gradual increasing global mean surface temperatures
 - c. Gradual increasing sea levels
 - d. Greenhouse Effect
 - e. Sources and Sinks of GHGs
 - f. Gradual CC vs weather extremes (frequency, intensity, magnitude)

2. **How can you relate to the definition (the process of adjustment to actual or expected climate and its effects (IPCC 2014) of climate change adaptation (CCA) in IPs?**
 - a. Adjustment in natural or human systems
 - b. Response to actual or expected climatic stimuli or effects
 - c. Moderation of harmful effects and exploitation of beneficial opportunities
 - d. Adaptation, mitigation, synergy
 - e. Pollution and CC
 - f. Exposure, vulnerability

3. **In recent times, have you dealt in advance or concurrently with a weather related event in IPs such as**
 - a. Floods
 - b. Storms/Cyclones
 - c. Heat waves
 - d. Drought

4. **What were the proactive measures that you had adopted to deal with such extreme events and to improve resilience to CC?**

5. What were the reasons/arguments for implementing these measures in the IPs?

6. If you were NOT effective in managing the effects of these events in the IPs effectively, what were the reasons, please rank them on following scale (1: Critically important; 2: Very important; 3: moderately important; 4: Important; 5: Less important; 6: Slightly important ; 7: not important)

- a. Could it be lack of authority
- b. Could it be lack of financial support
- c. Could it be lack of a policy framework, guidelines, incentives, etc.
- d. Could it be lack of awareness
- e. Lack of plans
- f. Lack of staff
- g. Lack of responses of other actors

7. Can you please list the skills required to be prepared to deal with climate change (both gradual and extreme climatic events) in IPs and can you rate them on the scale (1: Critically important; 2: Very important; 3: moderately important; 4: Important; 5: Less important; 6: Slightly important ; 7: not important)

Stakeholder Group: Governments / Planning agencies / DIC / Environment Engineers / PCBs

8. How would you score capacity of stakeholder Group of the with regard to extreme events (CCA aspects) and to improve resilience to CC.

0 (Bottom score)	No awareness, knowledge, skills, abilities
1 (Low score)	Minimum awareness
2 (Moderate score)	Awareness, knowledge, no skills, and ability
3 (High score):	Complete awareness, knowledge, skills, and ability

S.No	Tasks or Functions	Actual Score	Target Score
1	Planning to account for CCA, how to identify CC risk and integrate adaptation into planning		
2	Resilient management practices for IP due to CC		
3	Encourage PP models of finance to reduce CC risk		
4	Insure assets against extreme weather events		
5	Communicate risks of CC to investors		
6	Develop early warning systems		
7	Mandatory inclusion of CCA in EIA		
8	Review current standards and regulations in the light of CC		
9	Review financing for inclusion of CCA in IPs		
10	Establish provisions regarding minimum width of buffer zones/no settlement around industrial areas		
11	Create enabling environment for CC		
12	Others		

Source: Kabisch, S., Bollwein, T., Bank, P., Brulez, D., Varaprasad, S.S., HrishikeshMahadev, R., Ganta, R. 2015. Climate change adaptation for sustainable industrial development: A strategy outline for the implementation of the "Climate Change Adaptation Project (CCA)" in industrial areas of AP and Telangana, India.

Stakeholder group: Operators / Developers / IALA

9. How would you score capacity of stakeholder Group of with regard to extreme events (CCA) aspects and to improve resilience to CC

0 (Bottom score)	No awareness, knowledge, skills, abilities
1 (Low score)	Minimum awareness
2 (Moderate score)	Awareness, knowledge, no skills, and ability
3 (Top score)	Complete awareness, knowledge, skills, and ability

S.No	Tasks or Functions	Actual Score	Target Score
1	Manage drainage for run-off of excess water		
2	Mitigate heat islands		
3	Intermediate water storage; water recycling		
4	Green spaces/blue spaces		
5	Storm reduction measures; separate storm water/sewage; maintenance of drainage networks		
6	Location of critical infrastructure at higher elevations to prevent flooding		
7	Renewable energy/sustainable backup of power		
8	Cooling for ICT facilities		
9	Include CC aspects in designing of storage facilities		
10	Include CC aspects in guidelines, standards, building codes for CC		
11	Develop shade and cool storage facilities		
12	Others		

Source: Kabisch, S., Bollwein, T., Bank, P., Brulez, D., Varaprasad, S.S., HrishikeshMahadev, R., Ganta, R. 2015. Climate change adaptation for sustainable industrial development: A strategy outline for the implementation of the "Climate Change Adaptation Project (CCA)" in industrial areas of AP and Telangana, India.

Stakeholder Group: Industries / Associations**10. How would you score capacity of stakeholder Group with regard to extreme events (CCA) aspects and to improve resilience to CC**

0 (Bottom score)	No awareness, knowledge, skills, abilities
1 (Low score)	Minimum awareness
2 (Moderate score)	Awareness, knowledge, no skills, and ability
3 (Top score)	Complete awareness, knowledge, skills, and ability

S.No	Tasks or Functions	Actual Score	Target Score
1	Design green buildings; elevate buildings		
2	Thermal regulation of inside of industry		
3	Orientation of buildings away from S and SW		
4	Design roofs of industry to cope with storms		
5	Cooling capacities for processes and facilities to changes in exposure time		
6	Increase water efficiency in production; Reuse water		
7	Renewable energy sources		
8	Increase resource efficiency in production processes, reduce dependency on climate impacted raw materials		
9	Integrate CC in logistics, supply risks, identify critical components		
10	Communicate risks to suppliers; diversify suppliers, multi sourcing		
11	Increase storage of critical supplies		
12	New work practices to reduce heat stress for outdoor workers, drinking water, shelter for staff during CC		
13	Diversify markets, to different markets; innovate in new technologies, cooling technologies; climate friendly products		
14	Scale agro processing, to stabilize livelihoods		

Source: Kabisch, S., Bollwein, T., Bank, P., Brulez, D., Varaprasad, S.S., HrishikeshMahadev, R., Ganta, R. 2015. Climate change adaptation for sustainable industrial development: A strategy outline for the implementation of the "Climate Change Adaptation Project (CCA)" in industrial areas of AP and Telangana, India.

Annexure 3

Questionnaire for Capacity Need Assessment for Climate Change Adaptation by TSIC / APIIC

1. How do you score capacity of various officers of TSIC with regard to CCA aspects and to improve the resilience to CC in IPs

0 (Bottom Score)	No awareness, Knowledge, skills, abilities
1 (low score)	Minimum awareness
2 (Moderate score)	Awareness, knowledge, no skills and ability
3 (High score)	Complete awareness, knowledge, skill and ability

Sl. No	Description	Score			
		0	1	2	3
1.1	Understanding on climate change				
1.2	What are the climate risks for Industrial Estates?				
1.3	What is adoption to climate change?				
1.4	Why adoption to climate change needed for IPs?				
1.5	Adaptation strategies and options.				
1.6	Adaptation options related to IPs and industries				
1.7	Principles of sustainable industrial development				
1.8	Background on climate change and principles of climate change adaptation in industries				
1.9	Methodology for climate risk assessment				
1.10	Integration of climate resilience in the planning and management process of industrial areas				
1.11	Best practices for planning climate resilient IPs - technical				
1.12	Best practices for planning climate resilient IPs - management				
1.13	Integrating CCA into planning instrument such as EIA study				
1.14	National Building Code of BIS / Design of roads and drainage system resilient to extreme climates / Design of buildings resilient to extreme climates				
1.15	Energy Conservation Building Code – User Guide				
1.16	Energy - Auditing / Energy conservation fixtures for reducing the net energy foot				

Sl. No	Description	Score			
		0	1	2	3
	print for IP				
1.17	Adopting renewable energy for IPs, for meeting the emergency requirements of both lighting as well as critical process / operations and roof top solar systems to reduce the net carbon foot print of IP				
1.18	Water environment - Storm water management				
1.19	Water environment - Rainwater recharging structures				
1.20	Water Environment – Auditing / Water conservation fixtures / Common sewage collection, its treatment and recycling for reducing the net water foot print for IP				
1.21	Case studies of CC Impacts on existing IPs and TSIIC capacity for the adaptation				
1.22	Identification of critical CCA factors for incorporating in the planning stage of IPs				
1.23	IP layout planning duly addressing CCA requirements				
1.24	Green belt management				
	Aspects to be addressed through EIA study for addressing CCA				
1.25	Financing options and planning for CC Adaption in IPs				
1.26	Risk management for infrastructures of TSIIC / APIIC (Insurance for assets against extreme weather conditions)				
1.27	Awareness of possible litigations that might arise due to Collateral Damages caused by CC in IPs, that could result in ill-effects of health to surrounding communities, losses to the nearby units etc, and probable / possible compensations(e.g. could be similar to the victims of Bhopal gas accident)				
1.28	Rescue and Rehabilitation during extreme climatic conditions				
1.29	Knowledge and skill on creating enabling environment for CCA				
1.30	PPP models for CC adaption projects				
1.31	Implementation strategy of TSIIC / APIIC policy on climate change adaptation				

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