Progress Report on Implementation of Odisha Climate Change Action Plan

2015

Forest and Environment Department, Govt. of Odisha

CONTENTS

ABBREVIATIONS AND ACRONYMS

BAU	business-as-usual
CM	Chief Minister
GEDCOL	Green Energy Development Corporation Ltd.
GRIDCO	Grid Corporation of Odisha
ICMR	Indian Council of Medical Research
IFC	International Finance Corporation
JNNSM	Jawaharlal Nehru National Solar Mission
Kw	Kilowatt
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MoWR	Ministry of Water Resources
MW	Megawatt
NTPC	National Thermal Power Corporation
NVVN	NTPC Vidyut Vyapar Nigam Ltd.
OREDA	Odisha Renewable Energy Development Agency
PPA	Power Purchase Agreement
SAPCC	State Action Plan on Climate Change
SC ST	Scheduled Caste and Scheduled Tribe

Executive Summary

According to Intergovernmental Panel on Climate Change (IPCC), global surface temperature change for the end of the 21st century is likely to exceed 1.5°C relative to pre-industrial levels. If there is inaction the catastrophic 4^0 C rise in temperature will not be very far. Therefore it is important that there has to be ambitious mitigation and adaptation actions by all stakeholders at all level.

India has formulated its National Action Plan on Climate Change in 2008 with eight national missions. Odisha was probably the first state in the country to come out with a highly participative State Action Plan on Climate Change (SAPCC) in 2010 with 11 sectors. Subsequently 25 other states have also formulated their own SAPCC.

The purpose of this document is to understand and systematically capture adaptation and mitigation actions already implemented in the state. This is the first stock taking report by the Climate Change Cell mandated to track the progress. This report essentially highlights two essential elements (a) the ambition and commitment of the State to address the issue of climate change and reduce the vulnerability (b) show real progress in terms of acting on priorities set out in the State Action Plan on Climate Change (SAPCC) and making financial commitment.

The core of the climate change action planning process is to reduce the vulnerability and enhance adaptive capacity. This is in the scenario that, the increase or decrease of exposure pose significant barriers/constraints. Our approach has been simply to understand the financial commitment of the State in various adaptation and mitigation actions. Most of these activities are ***high priority*** activities. A classical expenditure review takes a long time, therefore a short and quick approach has been to treat high priority activities as "Highly Relevant" climate investment. The allocation figures from 2012-13, 2013-14, 2014-15 budget documents have been taken for all the 11

departments. Some departments have also placed funds with other departments (e.g. Mining with Forest Department, Transport with Urban Development Department) and have not reported climate investment to the cell separately. The physical achievement and expenditure (different from allocation have been reported in the annexure. The mitigation potential has been estimated both as on 2013-14 and projected up for near term (2020). The process indicators include the policies formulated to address climate change concerns (e.g. solar policy, Energy Conservation Building Code), institutional development and capacity building in the departments.

As per the analysis, it is clearly shown that the climate investment commitment by the State has increased to 4% (in 2014-15) of the total budget up from 3.3% in 2012-13. As a % of plan budget it is at 8.5% in 2014-15. The climate budget has increased from INR 1700 crore in 2012-13, INR 2184 crore in 2013-14 to INR 3207 crore in 2014-15. These numbers could be higher as it does not take into account cross-sectoral investment in MNREGA, etc. with climate benefits. In 2014-15, the total investment stands at INR 3207.26 crore, of which 51% have been for mitigation, 41% for adaptation and rest 8% for both. In terms of type of investment, the following table show the breakup for 2014-15.

Capacity Building	114.70	3.6%
Investment	2779.14	86.7%
Pilot/Demo	19.66	0.6%
Policy Action	48.24	1.5%
Pre-Investment	189.83	5.9%
Research Study	55.69	1.7%
Total	3207.26	100.0%

The State has also taken several initiatives helpful for climate change adaptation and mitigation. Agriculture and Water Resources Department lead in adaptation, Energy and Urban Development Department with Forest Department lead in mitigation with the later contributing even to adaptation. The net emission reduction potential through the listed mitigation actions are estimated to be about 510 million tonnes of CO_2 eqv.

Several policy interventions have borne fruit. The mainstreaming of disaster management and early warning system have helped the state in limiting the human casualty figures to less than 50 during very severe cyclone, Phailin in October 2013. It was also one of the largest multi-agency coordinated evacuation effort in recent history in the region. A case study has been included in this report. State has come up not only with a solar policy but also a specialised Green Energy Development Corporation to implement the ambitious clean generation programme. A climate resilient plan for the cities are in the offing. There is plan for strengthening the Climate Change Cell, the State Pollution Control Board, the specialised cells dealing with climate change issues in departments (e.g. Water Resources), State Designated Agency in Energy Department, etc. Some of these initiatives have been supported through the technical assistance component of the World Bank. The State has also come up with a low carbon growth strategy and PCB is spearheading the

climate change awareness issues among industries and other stakeholders. The Climate Change Cell in the Forest and Environment Department is coordinating across departments to compile information, progress and climate outcomes. This report is first such monitoring report compiled by the Cell with support from CTRAN Consulting (under World Bank TA).

However, it is important to note that the State has financed most of these activities from own budgetary sources and to achieve full potential it is essential that additional finances (climate additional) are made available. This is a barrier as on date. Apart from that, this is a new science and knowledge about climate change is formative in many areas in departments. Mainstreaming of climate change agenda and capacity building are the second important issue. Some of the large mitigation initiatives like dedicated freight corridor, modal shift to water ways, waste to energy, solar parks, loss reduction effort in T&D systems require huge investment. Similarly in adaptation, climate resilient agriculture essentially means not only building capacity of the farmers but also taking research to the farmers. Integrated water resource management too require large investment. These barriers need to be considered during the future implementation of the SAPCC and requisite support from Centre, technical agencies and if possible external aid may be mobilised.

Special representative of UN Secretary General, Ms. Margareta Wahlstorm presenting a Citation to Chief Minister Shri Naveen Patnaik for successful management of Phailin in Odisha during October 2013

Introduction

Background

Odisha was one of those states where the State Action Plan on Climate Change (SAPCC) formulation process started in a systematic and inclusive fashion. This template is now almost mainstreamed and followed by other states in preparing their own SAPCC.

Odisha was one of the first states that formulated Climate Change Action Plan through a comprehensive consultative process way back in 2010. The draft version of the report was released by Hon. Chief Minister on 5th June 2010. The State has formulated action plan in eleven sectors. These sectors have direct linkage with climate change and also link up with six national level missions. A Climate Change Cell has been formed in Govt. of Odisha to coordinate across departments and take stock of the progress made in the implementation of the State Action Plan on Climate Change(SAPCC) in the State.

This report essentially highlights two essential elements (a) the ambition and commitment of the State to address the issue of climate change and reduce the vulnerability (b) show real progress in terms of acting on priorities set out in the State Action Plan on Climate Change (SAPCC) and making financial commitment.

There is no standard definition of climate finance, any investment made in adaptation and mitigation of climate change impact can be broadly defined as climate finance. In international negotiations and in the deliberation between the State and Centre, this can be defined narrowly as new or additional finance.

Therefore attempt has been made in this document to at least identify and make some estimate of business-as-usual (BAU) fund flow for the proposed key activities.

Objective

The objective is to develop a monitoring format that can systematically capture adaptation and mitigation actions already implemented in the State.

Scope

A. Collection of data on investment in activities that have linkages to climate change adaptation and mitigation after the SAPCC formulation.

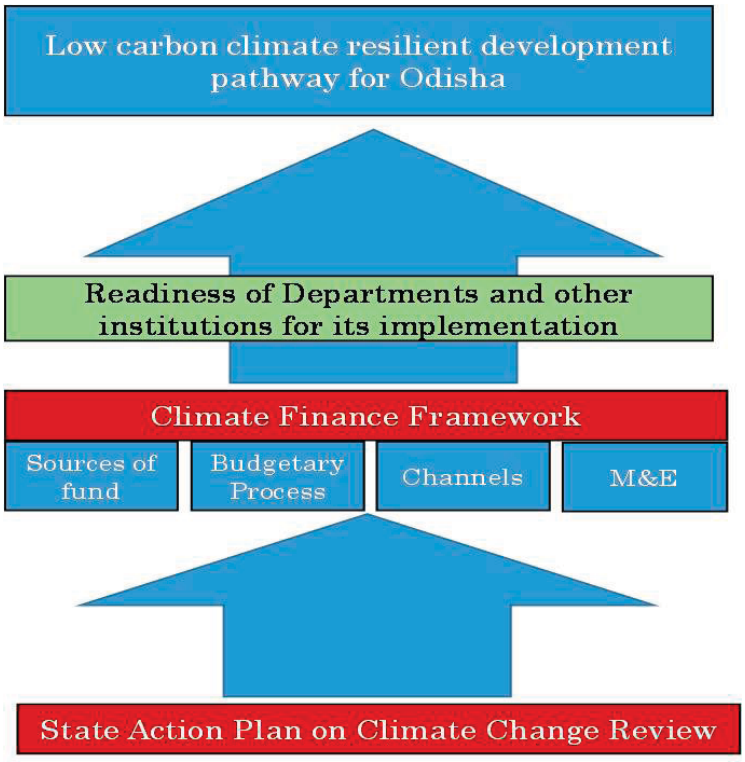


Figure 1 Scope of the progress monitoring

- description of the investment;
- geographic coverage;
- planned investments (future)
- financial details (allocated and expended);
- population served; and

"I hope that the action plan will be implemented in right earnest so that possible adverse impact of climate change are minimized and the development process is carried out in a manner which reduces carbon footprint."

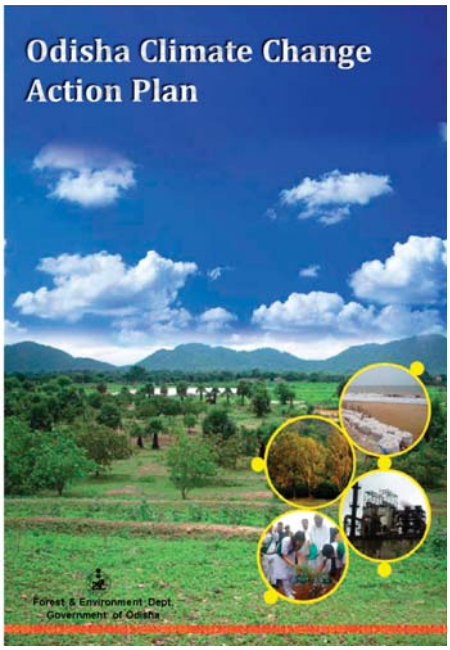
Shri Naveen Patnaik,
Hon. CM, Odisha

- implementation schedule (reporting period and subsequent years).

B. Develop a format for tracking and periodic updation at least each quarter.

C. Developing a format to collect data to compute carbon offset from response activities (actual computation of offset is possible only after the data is made available and feasibility of getting such data).

D. Developing a status report with recommendation.



Looking Ahead

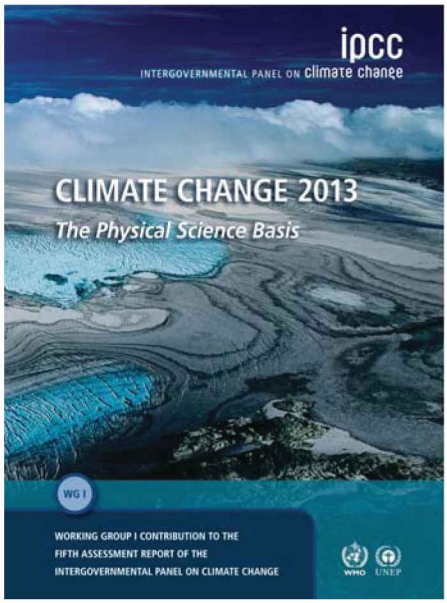
SAPCC is a strategic document and its implementation is a work in progress. This document is aimed at building perspectives. Effort is required to use as far as possible verifiable indicators to document the progress (both on adaptation and mitigation). It is important to note that many missions at the national level have not yet formulated clear targets. The State has also not received any climate additional budget. However, several activities that departments undertake contribute to climate change adaptation and mitigation. Many data sets required to link exposure, sensitivity and adaptive capacity are yet to be collected so that investment effectiveness in vulnerability reduction can be computed. This however shall be the ultimate use of the monitoring system that can be generated by the Climate Change (CC) Cell. An approach in this direction has been proposed in the following section.

Limitations

The dialogue with line departments is a time consuming exercise and difficult due to the financial year end and elections.

The tracking of adaptation outcomes are always challenging considering the long-term nature of the interventions; so many such projects have to be tracked on milestone basis.

The exact computation of offset using the IPCC 2013 standards would only be possible provided the data exists for different sectors where such mitigation is taking place. Appropriate scientific measures with reasonable assumption have been taken to compute the offsets.



Approach and Methodology

The approach presented here will be validated during the stock taking exercise.

Vulnerability: *as the degree to which it is susceptible to and unable to cope with the adverse effects of climate change, including climate variability and extremes.*

Public Expenditure Review (PER): *involves the analysis of the allocation, use and results of public expenditures with a focus on priority sectors/actions. For climate change actions, there is a conceptual hurdle. Many actions are not limited to one or a few sectors, but represent new and additional incremental spending across the whole of the economy.*

The budget analysis presented in the report is business-as-usual financial allocation and not a Climate Public Expenditure Review. The later takes a long time at least 6 months to 1 year.

The following approach have been followed to develop the state-level M&E systems. The approach was validated during the stock taking exercise. In this framework, a core set of quantitative indicators as well as some qualitative indicators have been developed. Policies and programmes do mostly have process indicators (e.g. energy conservation building code implemented, roof top solar policy note circulated for discussion, integrated water resource management policy formulated).

The core of the climate change action planning process is to reduce the vulnerability and enhance adaptive capacity. This is in the scenario that the increase or decrease of exposure pose significant barriers/constraints.

The vulnerability of a system is defined as the degree to which it is susceptible to and unable to cope with the adverse effects of climate change, including climate variability and extremes. It is a function of the character, magnitude and rate of change and variables to which the system is exposed, its sensitivity, and its adaptive capacity.

Therefore starting point of the progress monitoring was to trace the linkage to the vulnerability.

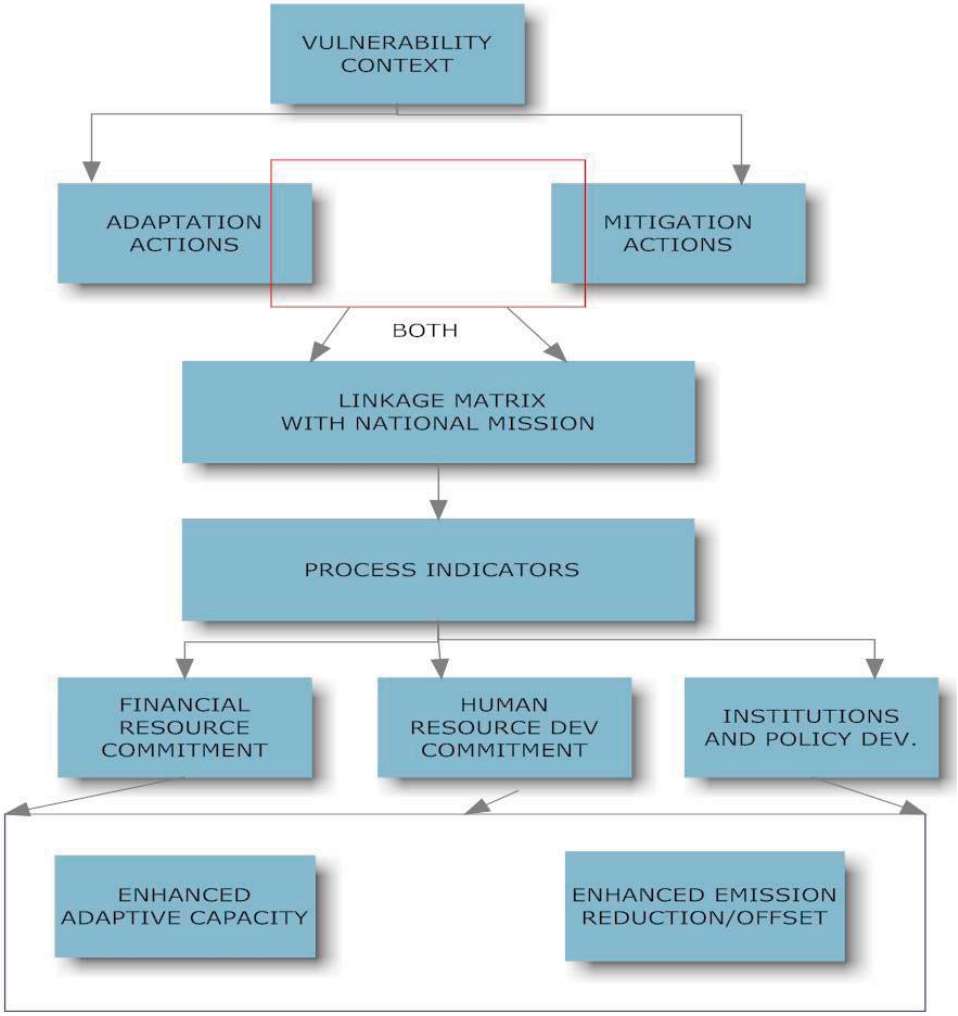


Figure 2 Approach to monitor the implementation of the SAPCC

Assessing adaptive capacity include commitment in terms of planning, policy, resource/capital deployment (financial, social, human), and use of technical options. It also includes assessment of existing institutions and their capacity (or even new institutions, e.g. Green Energy Development Corporation Ltd.), public perception on climate change and engagement with stakeholders.

Figure 3 Project cycle

The data from the departments have been obtained in a pre-defined format. This has been followed up with getting case studies on progress.

Budget documents have been analysed for taking stock of business-as-usual financial commitment.

So far, the audited utilization figures from each allocated components are not yet available.

Externally aided projects have been reviewed and links to climate change related priorities have been traced.

Overview of the Progress

This section covers the key missions and how the progress has been since their formulation. The State was the first in the country to come out with a comprehensive consultative action plan. The framework is now mainstreamed and being used in several other states. Since then the report has been forwarded to nodal ministry, Ministry of Environment and Forests (MOEF) in Government of India. This report (SAPCC) has been appraised for the final round on 25 February 2014 and recommended for endorsement by the apex committee. This has been a two year long process after its formulation.

Earlier a Climate Change Cell headed by Director, Environment has been notified in December 2012 in the nodal department of Forest and Environment, Government of Odisha. The cell is mandated to coordinate with the departments to track the progress on various climate change related issues.

Resource Allocation

This section describes the budgetary allocation of the Government to the sectoral departments as well as specific climate change related activities.

Approach

- The budget for the departments are taken from the Government of Odisha budget documents of 2012-13, 13-14 and 14-15.
- The net budget provisions have been taken from relevant departments in adjusting for the missions presented in the SAPCC. The adjustments have been made in the following manner:
    - Only disaster management allocation component of the Revenue and Disaster Management department;
    - Allocation for Energy department has been topped up with renewable energy allocation component of the Science and Technology department;
    - Industry department allocation has been combined with Micro, Small and Medium Enterprise department allocation;
- In analysis, both plan and non-plan components in revenue and capital accounts have been considered together as well as separately. Direction and administration components of the departments is linked to policy formulation, human resource management and it is largely a departmental responsibility. Therefore, this has not been excluded.
- The sources of funds include State Plan, Central Plan, Centrally Sponsored Plan for all sectors. Provisions made for the Externally Aided Projects have also been included. However, extra budgetary items that comes directly from donors, Development Banks, private sectors/foundations to implementing agencies and PSUs have not been captured. DISCOM loans are part of the Energy Department allocations.
- For the climate change related allocation, in the classical public-expenditure framework, the

assumption is that high priority activities presented in the SAPCC are considered as "Highly Relevant" and allocation against such activities are treated as climate related allocation (in strictest form).

- The cross-cutting areas where such allocation might have been made is difficult to segregate and have been excluded. e.g. MNREGA, a specific activity of RKVY like farm pond or mulching that have adaptation benefit.
- The detailed climate change-related PER is a time consuming exercise and beyond the scope of this document.
- All the climate related allocations (figures) are as per the data received by the Climate Change Cell from the departments; however, many departments have submitted requirement and not the allocation and some figures differ from the action proposed. Attempt has been made to rationalize such anomalies in consultation with the Climate Change Cell.

The analysis of budget has been presented in the following page:

Budgetary allocation for climate related actions have increased significantly since 2012-13.

The budget allocation for climate change related activities as a % of total budget (both plan and non-plan) has increased from 3.3% in 2012-13, 3.6 % in 2013-14 and 4% in 2014-15. *This is largely from highly relevant priorities identified in SAPCC.*

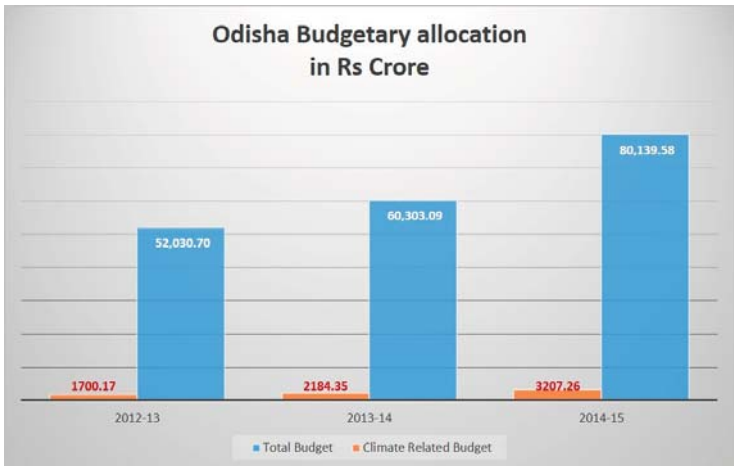


Figure 4 Budgetary trend for climate change related allocation

The climate related allocation has increased in absolute terms in last three years. This has been 9.6% of total plan budget in 2012-13, 9.8% in 2013-14 and 8.5% in 2014-15. As a % of total budget (both plan and non-plan) it has increased from 3.3% in 2012-13, 3.6% in 2013-14 and 4% in 2014-15.

Climate related budget as a % of plan budget has been shown in the figure below:

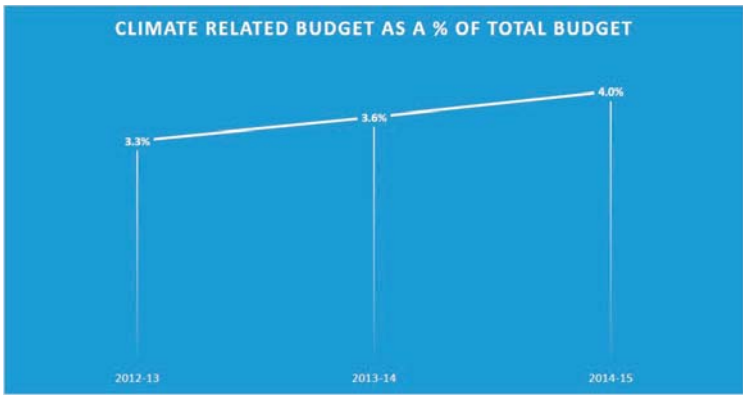


Figure 5 Climate related budget as a % of Plan Budget

Sector wise breakup of the budget is given below:

Sectors	Climate Budget (2014-15)	Climate Budget (2013-14)	Climate Budget (2012-13)
Agriculture	556.28	631.44	218.46
Coast and Disaster	319.46	208.00	36.15
Energy	509.40	367.48	274.33
Fishery and ARD	28.33	27.69	15.41
Forest and Environment	554.59	310.05	246.39
Health and Family Welfare	36.10	30.03	0.00
Housing and Urban Dev.	502.12	0.00	0.00
Industry	70.50	0.18	0.00
Steel and Mines	0.00	0.00	0.00
Transport	0.00	4.22	1.16
Water Resources	630.47	605.27	908.27
Total	**3207.26**	**2184.35**	**1700.17**

Even though some sectors like transport and mines do not report allocation, that is largely because they have either placed funds with other departments (e.g. Mining with Forest department, some part of coast and disaster related activity budget has been reflected in water sector, etc. The provisional budget pie for the year 2014-15 is given below:

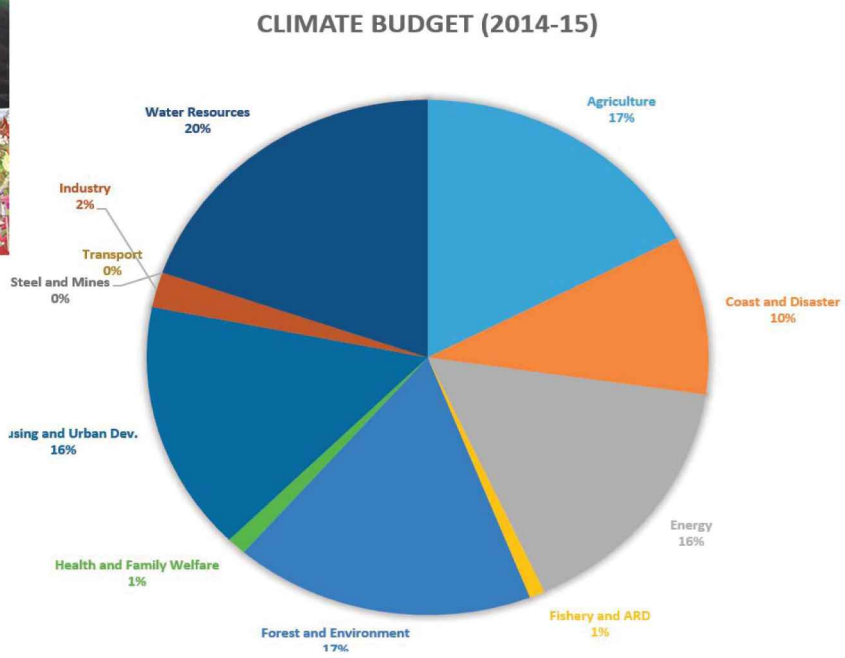
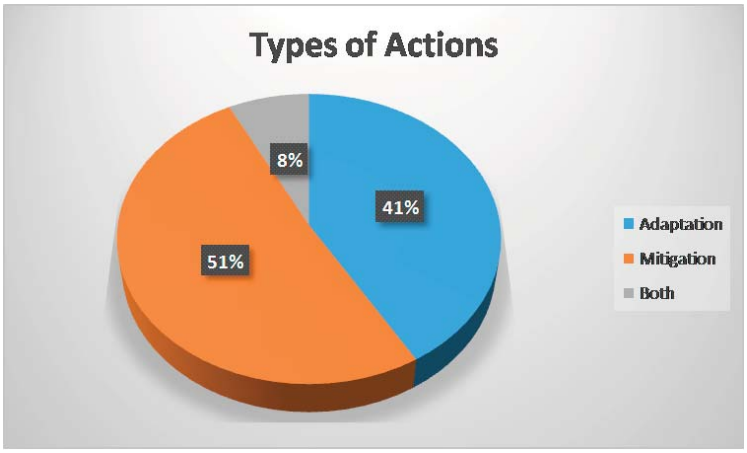


Figure 6 Provisional allocations proposed by departments for climate related activities

From the data it is clear that, large emitting sectors have managed to put higher allocations in their existing budget. Water Resource department, Revenue and Disaster Management department lead in adaptation related allocation, Forest and Environment, Coastal and Disaster Management, Agriculture contribute to both sides (adaptation and mitigation). Allocations for Energy department shows higher allocation in climate change related actions partly because of the massive T&D loss reduction initiative funded by both government and distribution companies financed by loan. This is 16% of the total allocation that was proposed for the entire five year period in SAPCC. Same is the case of Urban Development department. Therefore, the investments are on track. This will contribute to the mitigation. The charts below shows the type of actions and their share.

The figure shows that the maximum allocation little more than 51% out of 3 have gone for mitigation. Combined activities for mitigation and adaptation is about 8% and balance 41% goes for adaptation related investment.



The figure shows the main allocations are in investment, pre-investment and pilots. 87% is going for investment programs.

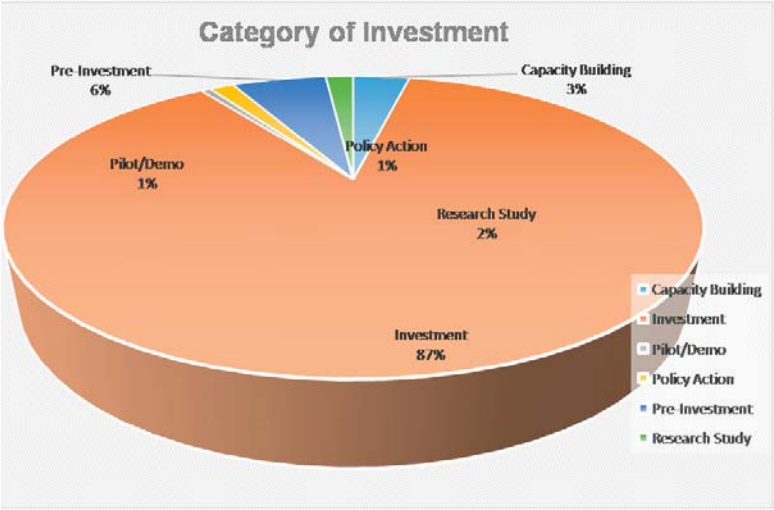


Figure 7 Main Activity wise climate budget segregation (2014-15)

Offset Potential

There are several mitigation actions that have contributed to the offset benefits. This computation is normative based on the allocations already made and activities taken up.

The total offset potential from the select sectors from the ongoing actions is estimated at 510 million tonnes of CO_2 eqv.

Approach

For offset calculation, one is based on activities taken up by 2014 and the second is by 2020.

- Renewable energy: commissioned projects for existing offset and potential offsets are based on the pipeline projects. (Grid is the baseline)
- Watershed projects: based on already allocated budget up to 2014 and potential is based on proportionate potential up to 2020 (the perspective plan is up to 2030)
- Plantations: based on allocations on past trend
- Agriculture: based on allocation on past trend
- Urban Development: based on waste generation normative; street lighting and MRT from project notes
- Mangrove: based on past trends/project report

The detailed assumptions are given below:

		Unit	by 2014	2014-15	2020 and beyond
Agriculture					
	SRI Rice Promotion	ha	4,000	10,000	30,518
	Annual Growth	%age	25%		
	Perennial plantation	ha	25,954	79,205	2,41,715
	Annual Growth	%age	25%		
	Micro Irrigation	ha	9,458	15,232	24,532
	Annual Growth	%age	10%		
	Watershed development	ha			
	No of MWS by 2030 (as per strategic doc/ perspective Plan	no	12,037		
	Treatable area per each MWS	ha	500		
	Total potential	ha	60,18,500		
	Already achieved	ha	98,328		
	Balance in 15 years	ha	59,20,172		
	Per Year		3,94,678		
Costal	**Mangrove Restroration / Generation**	ha	185	298	480
	Annual Growth	%age	10%		

- For Housing and Urban Development projects the estimates from DPRs of PPP projects taken up by IFC and other agencies have been taken into account.

The offset potential from the planned mitigation actions have been given in the table below

SECTOR	Mitigation Activities	Unit	Pilot undert-aken by (2013-14)	Planned by (2014-15)	Near Term Potential	Emission reduction current (by 2013-14) tCO2	Emission reduction potential (by 2014-15) tCO2
Agriculture							
	SRI Rice Promotion	ha	4,000	10,000	30,518	11,760	29,400
	Micro Irrigation	ha	9,458	15,232	24,532	22,651	36,480
	Watershed development	ha	98,328	3,94,678	19,73,391	9,83,280	39,46,781
Energy							
	Solar	MW	33		10,000	51,630	51,630
	Wind	MW			800		
	Biomass	MW	22	118	900	1,48,055	7,77,327
	Small Hydro	MW	57		129	1,64,276	1,64,276
	Municipalwaste to energy	MW			20		
	AT&C Loss reduction	MWH	7,43,151			6,98,562	6,98,562
	DSMandenergy efficiency	MW			500		
	Bio-gas and manure management	No (Cumu)	2,32,956	2,39,456	2,52,456	3,93,696	4,04,681
Urban							
	Energy efficient street lighting	No	30000	30000			10,500
	MSW (for Cuttack, Puri, Bhubaneswar)	tons	1,76,400			1,14,660	1,14,660
	TOTAL					**25,88,569**	**62,34,297**

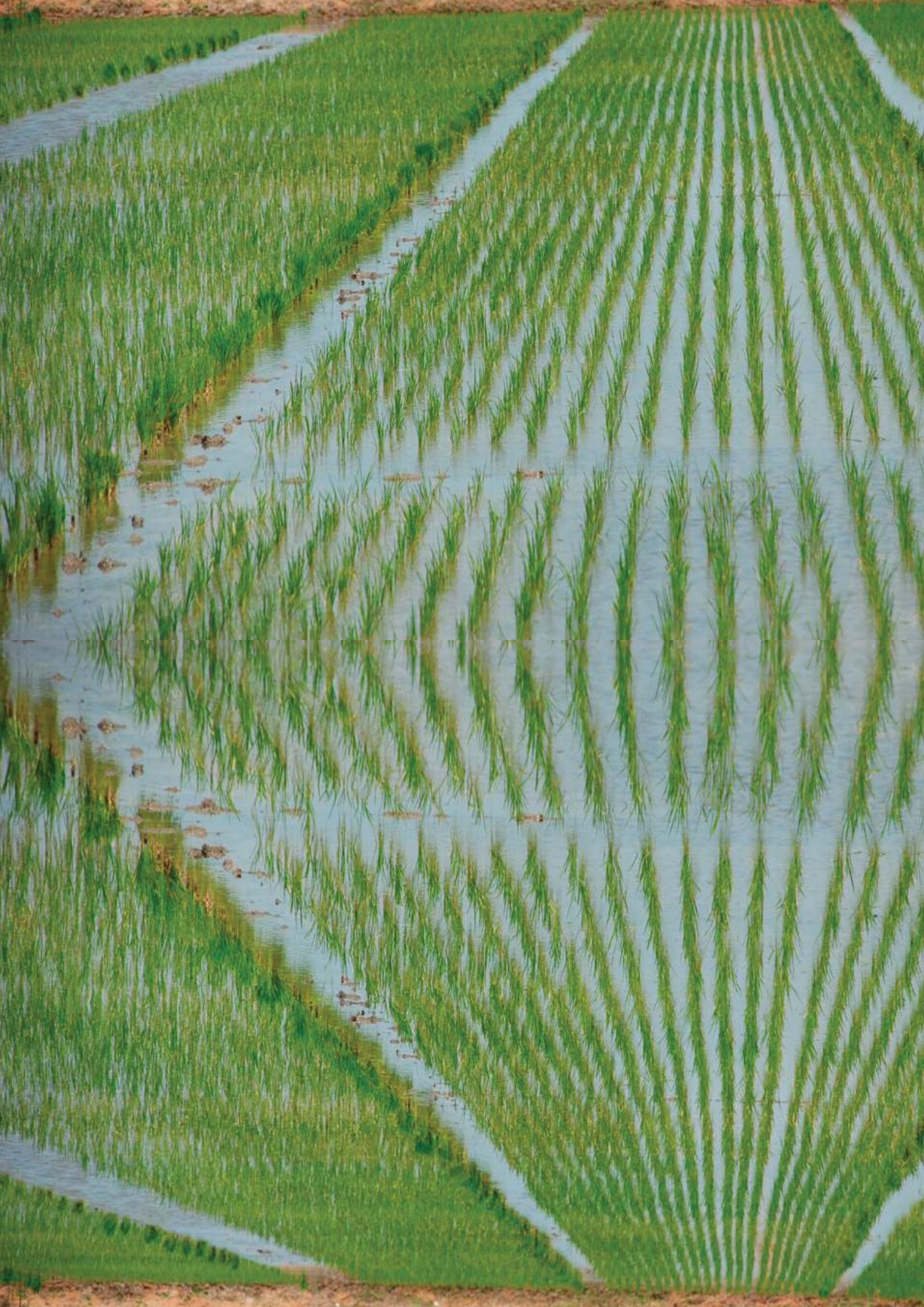
Near-term means 2020 and beyond.

The net emission reduction estimated to be achieved through various matigation actions listed above is about 6.23 million tonnes of CO_2 eqv.

Carbon sink as estimated by the study undertaken by Indian Institute of Science (Ravindranath et. al.) puts the sequestration at 456 million tonnes of CO_2 eqv. This will be possible through various conservation related programmes of the Foerst and Environment department and related agencies. The mangrove conservation alone is estimated to sequester about 3.2 tonnes CO_2/ha/year. The perennial horticultural plantations by Directorate of Horticulture is expected to sequester 1.4 million tonnes of CO_2 eqv. by 2014-15.

Forest and Environment department will take a lead in mitigation effort largely through an aggressive plantation drive for all the departments e.g. Forest and Environment department, Steel and Mines, coastal shelter belt, avenue plantations along the roads for surface transport and Works and Housing and Urban Development Departments apart from convergence funds from Industries, Watershed, Rural Development, Panchayati Raj, SC&ST development department, etc.

However, a lot more mitigation actions are possible and those have not yet been taken up by departments. The transport and industry (including MSMEs) have a strong potential for emission reduction. Similarly, waste management model undertaken by the H&UD department if scaled up would contribute much more than the existing emission reduction projected here.



Agriculture

Importance of the sector for the State

Farm Pond, Khajuripada, Kandhamal

Diversion Weir, Khariar, Nuapada

Seven out of ten people in the state live in rural areas and depend on agriculture. Paddy is the main crop and about 2/3rd of the land area is dependent on rain-fed agriculture. Agriculture contributes about 22.5% to the Net State Domestic Product. Total number of cultivators and agricultural labourers as per 2011 census is 410,399 and 6,739,993 respectively. State has made remarkable progress in agriculture sector. The Krishi Karman Award for 2012-13 has been bagged by Odisha for being the best performing state in overall food-grains production among Category-II States in India. It was for its contribution to the growth of agriculture in the state and for achieving a record food-grains production of 11.4 million tonnes during 2012-13. The state accorded priority to agriculture through providing enhanced support for farm mechanization, soil health management, assured irrigation, fertilizer use, organic and integrated farming and extension of agricultural services to achieve this. In horticulture too, Odisha has been declared the Best State in the Country in implementing schemes under the National Horticulture Mission (NHM) and it is the second largest producer of brinjal and cabbage and is the third largest producer of cauliflower, okra and tomatoes in the country.

Key vulnerabilities

Agriculture sector is highly vulnerable to temperature stress, intermittent incidence of drought, flood and extreme weather events like cyclone. There is also higher incidence of pests and diseases. It is established that, there is a risk of desertification in south-west Odisha, decline in crop yield in northern Odisha, decline in food availability and higher incidence of malnutrition in South-west Odisha. Coastal areas would face more of tropical cyclone with higher intensity.

Key priorities taken up

The following paragraphs show the key adaptation and mitigation actions taken up in this sector.

SRI Rice cultivation: [AG/CAP/18]

Rice is predominantly cultivated in Odisha. Conventionally famers use cow-dung as a source of manure for several crops including paddy. Farmers leave cow-dung heaps in the field for it to mix in water and that enhances methane emission. The method of alternate drying and wetting reduces methane emission by 30%. Apart from this, the method uses low seed rate, uses less amount of water (30-40% less water consuming) and also has reduced incidence of pest and diseases. Emission reduction of 2.94 tons of CO_2eqv/ ha/year is possible considering two crops of paddy/year. The total area covered so far is 4000 ha and target is 10,000 ha for 2014-15 with an investment of INR 8.5 crore.

SRI Rice is a huge success in Odisha

Diversion weir Laxmipur(koraput)

Micro-irrigation system: [AG/KP/6]

The flood method of irrigation results in excess use of natural resources and electricity. The benefits of micro-irrigation in terms of water saving and productivity gains are substantial in comparison to the same crops cultivated under flood method of irrigation. Micro-irrigation is also found to be reducing energy (electricity) requirement, weed problems, soil erosion and cost of cultivation. According to data available from research stations, productivity gain due to use of micro-irrigation

Micro-irrigation is not only efficient productive too

is estimated to be in the range of 20 to 90 percent for different crops (INCID, 1994; 1998). The water saving for fruits and vegetable crops varies from 12 percent to 84 percent per hectare over the conventional method of irrigation (Narayanamoorthy,2005) and this results in energy saving too and reduces emission. 487 sprinklers sets and 399 sets of pipes have been provided to farmers with an investment of INR 0.96 crore. 9458 ha have been covered under micro-irrigation by 2013-14.

WORLP watershed areas have changed life and livelihood of several families who used to migrate.

Watershed Development:[AG/KP/4]

Integrated watershed development comprises practices that ensure enhancement of carbon stock (soil organic carbon) due to afforestation of catchment area, soil and moisture conservation initiatives like check dam, farm ponds, etc. It also helps in emission reduction due to the enhanced ground water recharge (improvement in water table in recharge area). It is also responsible for reducing climate variability (Singha, et.al.).

Odisha successfully implemented two award winning (green award) livelihood programmes with integrated watershed development at its core. These programmes Western Odisha Rural Livelihood Programme (WORLP) and Odisha Tribal Employment Livelihood Programme (OTELP) have now been mainstreamed to the entire state and now follows common watershed guideline. The total area achieved under watershed is about 98,328 ha with an investment of INR 200 crore in the year 2013-14.

Perennial Plantation: [AG/KP/5]

Mango Bonanza

Perennial plantations enhance the carbon stock and also have no-regret adaptation benefit as they diversify income source, enhance nutrition security and also are relatively stable against climate variability and change. The state has piloted an unique bundled AR-CDM initiative for farmers planting mango, guava in degraded areas of the state. It is expected to generate one million US $ CDM revenue. It has obtained host country approval and is under validation. 25,954 ha have been covered under perennial plantations with an investment of INR 373.1 crore in the year 2013-14.

Creation of Farm Ponds: [AG/KP/6]

Farm ponds have strong climate adaptation benefits as they recharge the aquifers and improve the ground water table. The activity reduces crop failure and enhances better nutrient absorption. The total number of community and individual farm ponds developed are 522 nos with a financial outlay of INR 11.7 crore in the year 2013-14.

E-pest surveillance:[AG/KP/7]

This is a preparedness programme with early warning system and is being implemented in all the 30 districts of Odisha. The programme helps in tracking disease and pest incidence and extent of damage and preventive management practices. The total financial commitment in 2013-14 for this exercise is INR 1.9 crore.

Awareness building of Farmers: [AG/KP/3]

Capacity building of farmers on climate change, water use efficiency, post-harvest management and soil water conservation have been taken under different programmes of the state (Integrated Watershed Development Programme, National Horticulture Mission, RKVY, etc.). More than 1500 farmers have been trained.

Budgetary allocation

Total budget for agriculture in the last three years and the climate budget has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for agriculture sector	2,727.99	1,823.77	1,519.31
Climate change related	556.28	631.44	218.46

Adaptation	36.60
Mitigation	519.69
Both	0.00
Total	**556.28**

E-pest surveillance system

Capacity Building	3.56
Investment	506.71
Pilot/Demo	19.66
Policy Action	0.00
Pre-Investment	0.00
Research Study	26.36
Total	**556.28**

For 2014-15 the plan outlay has been INR 2728 crore out of which climate change related investment is INR 556.28 crore. The detailed breakups of allocation have been given above.

Total emission offset

From the mitigation actions it is estimated that 14,86,382 tonnes quantity of CO_2 can be offset from this sector.

	Unit	Pilot undertaken by (2012-13)	Emission reduction by (2013-14)
SRI Rice Promotion	ha	4,000	11,760
Perennial plantation	ha	25,954	4,68,691
Micro Irrigation	ha	9,458	22,651
Watershed development	ha	98,328	9,83,280
Total			**14,86,382**

SRI Paddy Cultivation under Zero Budget Naturalfarming

Key adaptation initiatives

Activities like crop contingency planning, awareness building on climate change, integrated watershed management, crop diversification (from mono-cropped paddy to vegetables and fruits) are likely to enhance the adaptive capacity of the farmers in the state. Post-harvest management, seed production and replacement are being taken up in public-private community partnership mode. Formation of large number of farmer producer organizations are also good adaptation initiatives.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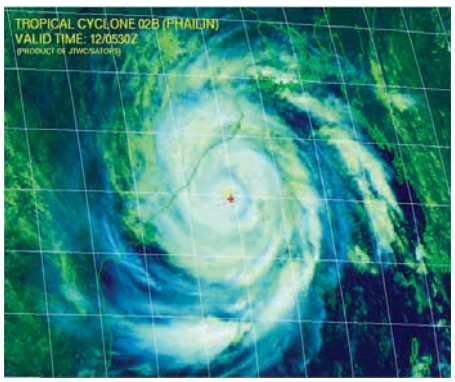


Images of Cyclone Phailin (October 2013)

Coast and Disaster Management

Importance of the sector for the State

Odisha has 480 Km coastline and sustains the livelihood of marine, brackish and artisanal fishermen apart from ports acting as a major trade outlet. Marine fishery is a key foreign exchange earner for the state. It has exported INR 793 crores value of marine fish to other countries in 2011-12. Brackish water prawn is in great demand in Europe, Japan and some East Asian countries and USA.

Odisha has faced cyclones and floods intermittently in last 105 years of history. The state has been disaster affected for 95 times during this time. The frequency and intensity of cyclones in the state has been increasing due to climate change. The state also suffers from slow on-setting of drought and intense heat waves due to high climatic variability. The state has put in place a comprehensive disaster management policy and Odisha State Disaster Management Authority spearheads several adaptation and mitigation actions. The recent management of **very severe cyclone** 'Phailin' has seen evacuation of more than a million persons with a casualty figure of less than 50. This has proven the effectiveness and resilience of the institutions and processes tackling disasters in the state.

Key vulnerabilties

The state is disaster prone and a victim of vagaries of monsoon leading to droughts, heavy precipitation in some pockets leading to flood and it is also a regular victim of tropical cyclone. Many of these events are triggered by warming of the sea surface.

Key impacts of sea level rise include land loss and population displacement, flooding of low lying coast areas and saline water ingress impacting the fresh water in the vicinity. Crop loss is also envisaged due to salinity and reduced availability of fresh water. Some types of fish move deeper or farther due to warming of sea surface and there is adverse impact on catch. The coast tourism and infrastructure also get impacted due to cyclone and storm surge.

Key priorities taken up

Identification, integration of climate change related risks, issues and knowledge: [CD/KP/3 and CD/KP/11]

Odisha is implementing a major World Bank funded Integrated Coastal Zone Management Project (ICZMP) focused on coastal adaptation. The project has generated several strategic knowledge as part of the project implementation. It includes (a) a regional coastal process study to assess coastal vulnerability and adaptation options (b) a comprehensive bathymetry (c) mangrove and coastal protection measures (d) alternate livelihoods based on conservation focused eco-tourism. It will also aid in modelling the sea level rise.

Eco-tourism at Mangalajodi, in the banks of the Chilika Lake

Construction of Multi-purpose Cyclone Shelters: [CD/KP/6]

365 multi-purpose cyclone shelters have been constructed in the coastal areas and have been handed over to the community based Cyclone Shelter Management and Maintenance Committees. In addition 14 such shelters (that can accommodate 1000 people each) are being

Cyclone-Shelter

constructed by ICZMP and 150 more are due under National Cyclone Risk Mitigation project by 2015. Both these projects are supported by the World Bank. These shelters can withstand wind velocity of 300Km/hr. The shelters are also equipped with basic amenities and communication gadgets like sat-Phones, HAM radios, VHF sets, etc.

Sl. No	Item of Work	Unit	Total to be constructed	Completed during the quarter	Total completed as on 31.12.13	Under execution	Benefits Accrued
1.	MPCSs	No.	150	5	14	140	14 villages -17,500 vulnerable population.
2.	Approach Road	No./ km	134/ 175.33	4 (6.82)	29/ 22.85	105/ 152.48	99 villages-81,142 vulnerable population
3.	Saline Embankment	No./ km	12/ 61.06	-	-	12/ 61.06	-
Total			300/ 236.39	9 (6.82)	43/ 22.85	257/ 152.48	56 villages-59,500 vulnerable population

Sustainable shelterbelt plantation, mangrove generation, etc. [CD/KP/9]

Mangroves in Bhitarkanika National Park

Under ICZM project, restoration of mangroves has been done in 138 ha area along the river banks. New plantations have been undertaken in 30 ha by 32 Eco Development Committees. A cadre of para-professionals has been developed for river protection, mangrove protection and crocodile protection. A modest target has been set for 185 ha and this can be enhanced to 400-500 ha if the anthropogenic pressure is reduced (as per the NMGRC estimate in six mangrove zones in the state).

Prediction of sea level rise through appropriate modelling [CD/KP/15]

Regional coastal process study that aids to predicting the sea level rise was undertaken for the first time in the country under the World Bank supported ICZM programme, The study was conducted using advanced equipments like wave rider buoy, tide gauge, current meter, etc. This will significantly enhance state's preparedness.

Impact of global warming on the bio-diversity of coastal ecosystem [CD/KP/16]

The following studies have been undertaken by Chilika Development Authority

- Five year study of water birds of Chilka
- Five year study on fisheries diversity
- Four year study of macro-phytes of Chilika
- Two year study of benthos and meibenthos
- Three year study of microbial flora

Case Study on Management of Phailin

This was a major event that validated the disaster management policy of the state. The management of Phailin is a team effort with each related department pitching in with Chief Minister leading from the front. The very severe cyclonic storm PHAILIN crossed Odisha & adjoining north Andhra Pradesh coast near Gopalpur (Odisha) around 2230 hrs IST of 12th October 2013 with a sustained maximum surface wind speed of 200-210 kmph gusting to 220 kmph.

On 8th of October when the information was received, an emergency meeting was convened and mitigation and management plan was reviewed. On 9th of October 2013, the concerned departments that included Revenue and Disaster Management, Odisha State Disaster Management Authority, Home, Energy, Health and Family Welfare, Animal Resource Development, Rural Development, Housing and Urban Development, School and Mass Education, Women and Child Development, Food and Civil Supplies and Fire Services attended the review meeting. Chief Secretary reviewed the prevention measures and ambitious targets were set for prevention of life loss and evacuations. Help from Central ministry (railway, defence, etc.) were also sought. Initially 14 districts were alerted and later following the change in cyclonic path more districts were added to the list. Leaves of officers were cancelled and essential supplies like dry ration, candles and medicines were quickly procured activating emergency protocol.

Phailin in the year 2013

Collectors of the mapped areas where cyclone was expected to cross, were given unified responsibility to coordinate response, rescue and relief operations. The people of the affected area were informed time to time through various media on the need for evacuation. Cyclone shelters and public buildings were used to accommodate people. Health and Family Welfare department established emergency control rooms stocked with essential drugs, disinfectant, alternate power back up for patients and expectant mothers in vulnerable

areas. Blood units, trauma units were organized and paramedics were fanned out in the affected areas. 338 medical relief centres, 185 mobile health teams worked continuously. Disease surveillance and collection of samples after cyclone was undertaken to arrest the spread of any epidemic. Energy department which braced for maximum damage to its power lines, made elaborate effort to salvage power transformers and used heavy equipment and manual labor to quickly restore power systems in many parts of the states. Agriculture department which already has a disaster contingency plan, started making assessment of loss to the standing crops, Animal Resource Development department and Forest and Environment department made elaborate arrangements to minimize damage to the loss of livestocks and wild animals in the affected area. Housing and Urban Development department worked closely with NDRF and ODRAFT team to ensure drinking water supply, opening up of roads in the affected cities and ensuring rescue and relief. All the while Special Relief Commissioner coordinated with Collectors and emergency response personnel to ensure smooth coordination. Chief Minister reviewed the preparedness and the rescue operation with senior Ministers and Secretaries to ensure that there was no slip up in rescue, relief and rehabilitation.

As a result, the state managed to evacuate 9,83,642 persons from cyclone affected area and 1,71,083 persons from flood affected area limiting the human life loss to less than 50. This was one of the most successful evacuation and probably an extremely well managed disaster response in recent history. As a global recognition to this effort, Special Representative of UN Secretary General, Ms. Margareta Wahlstorm presented a Citation to Chief Minister Sri Naveen Patnaik for successful management of cyclone Phailin.

Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Coastal and Disaster Management	2660.94	1337.62	1191.44
Climate change related	319.46	208.00	36.15

Adaptation	319.46
Mitigation	0.00
Both	0.00
Total	**319.46**

Capacity Building	30.00
Investment	284.75
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	4.71
Total	**319.46**

Solar rooftop project in Odisha

The gas which is produced in gobar gas plant is used for daily cooking

Energy

Importance of the sector for the State

Energy is the critical impetus to sustain and foster socio-economic growth, industrial development, livelihood promotion, increased agricultural productivity, access to water, improvement of health scenario and poverty alleviation across the state. None of the objectives of the Millennium Development Goals (MDGs) that the state is able to meet would have been possible without access to sustainable source of affordable and reliable energy. The energy sector has also supported emerging economic development priorities across the states. Industrial sector contributing substantially to state GSDP has grown several fold with numbers of industries of large, medium and small scale being established during the last decades on the pillar of sustainable and reliable energy supply. It is needless to emphasize that the sustained economic growth across the state is placing enormous demand on its energy resources and any uncertainty about its supply can threaten the functioning of its economy. As projected by Central Electricity Authority (CEA) the installed capacity requirement will be 8655 MW as against the current (2013-14) requirement of 7833 MW. To meet up its development needs, the state is using its available domestic reserve of coal, hydro and other renewable energy resources and supplementing in-house availability by interstate procurement and import. In this context it

is equally important to realize that energy usage sourced from primary fossil fuel reserve has detrimental impact on local environment and global climate. Providing affordable, reliable and sustainable energy while addressing the concern of energy security and mitigating climate change is the biggest challenge in the state and requires strategic intervention as proposed under the State Action Plan on Climate Change to be implemented.

Balimela-Hydro-Electric-Project

Key vulnerabilties

The power generation in the state is predominantly from hydro resources and is likely to be impacted under the projected climate variation. The most likely impact might be in terms of variability of water availability/ discharge, extreme climate events like flood and drought, increased sediment from variation in river hydrology. Even the coal based thermal power plants might face the impact of projected reduced water availability leading to reduced generation. Extreme climate events like flood, storm, cyclone, etc. might destroy the transmission and distribution infrastructure including damage to the power plants. Reduced generation will impact economic and industrial development and entire process of economic evolution and growth.

Chipilima-Hydro-Electric Project

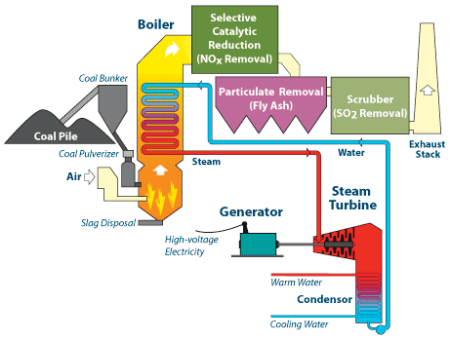
Key priorities taken up

Generating cleaner energy through clean coal approaches [ENERGY/KP/1]

The state Energy department has strategized sustainable and climate friendly approach to meet up the increasing energy demand across the state. Cleaner technology and enhanced energy efficiency approach is integrated as part of the developmental planning. Following are the detailed action planning undertaken that explicitly establish the departmental endeavor to contribute positively to climate change mitigation while sustaining the growth.

Coal Washery Power Project at Angul

1. Three Ultra mega power projects are planned in the state with 4000 MW capacity each;



Supercritical Power Plant

Two sub critical units of OPGC

2. Coal reject based power plant is planned in the state;

3. State Government is encouraging the developers to set up super critical power plant for lesser coal consumption and increased energy efficiency.

4. Washed coal provisions have been proposed for the IPPs (29 MOU has been signed with IPPs for setting up of 38,000MW in the state) and to this effect setting up of coal washery of suitable capacity are under consideration. The initiative will result in reduction of GHG emission as compared to baseline, saving in transportation, improvement in plant efficiency and reduction in auxiliary power consumption.

5. Power developers have proposed to establish fluidized power plant to utilize coal washery reject.

6. Optimization and improvement in plant efficiency have been carried out by the existing power plant in the state. This include two sub critical units of OPGC of 210 MW each through plant life cycle assessment. Phase wise implementation of recommended R&M measures are undertaken to improve and sustain power plant operational efficiency.

7. OPGC has also planned for up-gradation towards reduction of specific fuel oil consumption, optimization of coal consumption, improve heat rate and waste minimization.

Institutional development (Capacity building/ restructuring) of Energy Department for implementing policies and conducting studies. [ENERGY/KP/2]

Activities are facilitated towards promotion of renewable energy technology and energy efficiency measures. Details of the activity undertaken includes:

1. Functional reorganization and capacity building of Energy Department, OERC and OREDA are being taken from time to time.

2. State Government is in the process of formulating comprehensive Thermal Power Plant policy.

3. Renewable Potential were estimated by the Science and Technology department, OREDA and through a third party agency.

4. Renewable Power Obligation (RPO) has been framed for increasing the share of renewable in the state and are as follows:

Year Wise Target	Minimum Quantum of Renewable Energy purchase in % of the Total Energy Consumption in the state			
	Renewable		Co-generation	Total
	Solar	Non-Solar		
2012-2013	0.15	1.40	3.95	5.50
2013-2014	0.20	1.60	4.20	6.00
2014-2015	0.25	1.80	4.45	6.50
2015-2016	0.30	2.00	4.70	7.00

5. Proposal for strengthening and restructuring of the EIC (E) for implementation of different activities including action plan for energy conservation has been prepared.

6. Proposal for promotion of small hydro has been prepared.

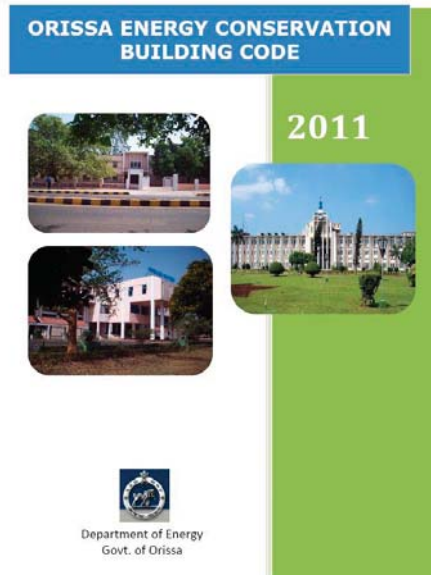
7. Specific proposal for setting up of the project management unit for energy conservation has been prepared.

Current Transmission and Distribution

Reduction of T&D Losses [ENERGY/KP/3]

State Government has framed ambitious plan of reducing the current T&D loss of 38.28% and AT&C losses of 43.29% respectively thereby abating generation through a planned investment of Rs 2400 crore over a period of 4 years. Measures have already been taken towards implementation of 500 nos of additional 33/11 KV substations to strengthen the infrastructure of existing electrical network. Initiatives like re-conducting of

overhead 33/11kv line conductor, new overhead 33 KV line, capacitor bank, load balancing and proper earthing are taken up towards reduction of technical loss. Activities like energy accounting and energy audit, MRT squad operation, 100% metering and billing, replacement of LT conductor with AB cable, use of IT/AMR system are being taken up towards reduction of commercial losses.



Promotion of Demand Side Management [ENERGY/ KP/4]

Initiatives are facilitated and actions are being framed towards enhancing energy efficiency as a capacity avoidance and climate change mitigation measures. These measure have been outlined as follows:

1. Awareness programmes for disseminating energy conservation and energy efficiency amongst the different category of stakeholders are planned under the proposed priority action.
2. Capacity building has also been included in the plan so as to ensure implementation, monitoring and enforcement of energy efficiency measures.
3. Framing of Energy Conservation Building Code matching local requirement towards improving energy intensity across the building sector.
4. Undertaking Energy Audit and implementation of energy conservation measures across Government Building.
5. Energy audit of the water pumping stations.
6. Roof top solar photovoltaic power plant coupled with CFL and LED has been implemented at Secretariat building as model demonstration project towards promoting renewable energy and efficient lighting measures.
7. Special financial support scheme has been created to support Govt. owned organization, industries, autonomous organization and co-operatives for improvement of energy efficiency.

Energy Audit

8. Implementation of energy efficiency measures has been taken in 3327 lift irrigation systems under Pani Panchyats.

9. Use of energy efficient appliances and their promotions among consumers towards reducing energy wastage.

10. Installation of capacitor banks and APFC panels at load end and distribution transformer end.

Fly Ash utilisation and emission reduction from Power Plants

Fly Ash utilization and emission reduction from power plants [ENERGY/KP/5]

Continuous initiatives are facilitated by the power plant developers as well as by State Pollution Control Board towards reduction of ash accumulation and its optimal utilization. The projected capacity addition of 60000 MW of coal based thermal power plant is likely to result in 120 MTPA ash. As part of the initiatives power plant developers have been asked to follow OSPCB stipulation regarding fly ash management. As a part of the endeavor OPGC has planned to dispose fly ash in high concentration slurry form in place of existing lean slurry disposal from the year 2016 onwards towards lowering water pumping requirement and highest land utilization. A Fly Ash Resource Centre (FARC) has been established in SPCB to oversee and enhance fly ash utilisation. A high level committee under to Chairmanship of Chief Secretary has been constituted for maximing is utilization of fly ash in the State.

Promotion of small and medium hydro plants [ENERGY/KP/6]

Policy support has been announced to promote small hydro-electricity programme (SHEP) by allowing private sector investment. Besides 3 numbers of SHEPs of cumulative capacity of 57 MW have been commissioned during 11th plan period. 33 numbers of MOU have been signed with private developers. Institution's like WAPCOS and IIT were engaged to support in checking and approving design and drawing. Prefeasibility reports are prepared for four numbers of project of cumulative capacity of

Promotion of Hydro Plants - Upper Indravati Project

12.9 MW and work order are issued for preparation of prefeasibility report of fourteen sites of estimated cumulative capacity of 166.5 MW.

Maximize Harnessing biomass potential in the state [ENERGY/KP/7]

As part of maximizing and harnessing biomass based power generation potential, RPO is announced for non-solar power requirement at 1.2% in 2011-12 and increased to 2.00% of total energy consumed by 2015-16. GRIDCO has executed power purchase agreement with nine numbers of proposed biomass based power projects of cumulative capacity of 118 MW out of which only 20 MW is commissioned. District wise potential for biomass (primary resource assessment of biomass like paddy straw, cotton stalks, maize cobs and other) were assessed for estimating the power generation potential as well as development of biomass supply chain. Four numbers of project cumulating to total capacity of 2.475 MW have been commissioned for the rice mills and further four numbers of project of cumulative capacity of 4.47 MW are currently being assessed. Biomass based CPP are being encouraged in sugar and paper mills to avail the benefit of Renewable Energy Certificate (REC).

Rice Husk Power Plant

Bio-mass Power Project

Promotion of grid based wind power generation [ENERGY/KP/8]

Assessment of wind power potential, identification of wind sites and capacity building towards promotion of wind power generating units are presently being facilitated by OREDA to harness wind power potential and promote wind based power generation in the state. Proposal for 72.25 MW in Damanjodi and 13.5 MW in Gopalpur are under active consideration. Wind resource is being currently assessed at 10 sites and 15 more locations are under consideration that would be assessed during 2014-15.

Maximize Solar Power Generation [ENERGY/KP/9]

The state has made notable progress in maximizing the solar power generation in the state. Initiatives

include setting up power projects, determining RPO towards creating requirement for solar based power and assessment of solar power potential. Green Energy Development Corporation (GEDCOL) has been formed by the State Government at initial share capital of Rs 100 Crore as a 100% subsidiary company of OHPC to explore huge potential of Solar and other renewable energy sources. The achievement in this respect is outlined as follows:

1. GRIDCO signed PPA with 8 numbers of solar PV projects of 1 MW each under RPSSGP scheme. All the 8 projects are commissioned and injecting power to GRIDCO system.
2. PPA of 20 MW signed with NVVN under JNNSM scheme. 5 MW is commissioned and injecting power to grid;

3. PPA signed with NTPC under bundling scheme for 5 MW;
4. 3 MW of off-grid and standalone power project is implemented in the state.
5. 50 kWp roof top solar power project is in Odisha Secretariat building.
6. Solar PV and thermal system in Jagannath Temple, Puri and Rajbhaban, Bhubaneswar have been commissioned.
7. 16 proposals for setting up solar radiation source assessment stations in Odisha has been done and sent out to C-WET.
8. 30 numbers of proposal were received from different departments for installation of roof top solar power plants.
9. OREDA has taken up activities like proposal for floating RFPs for establishment of 25 MW solar power plant in Odisha, proposal for electrification of 224 remote villages, proposal for installation of 30 numbers of rooftop solar power plants in government buildings, supply of 10072 numbers

Rooftop solar project installations in Odisha

of Lantern to Handloom Weaver Families, 100 numbers of roof top solar plants in the buildings, 20 numbers of solar power plants in hospitals and use of SPV systems for irrigation and drinking purpose.

10. OPGC has planned solar water heater system for its guest house and canteen and installation of solar PV panel for meeting plant service building & resource centre lighting load.

11. OHPC has planned 22.5 MW solar plant at three locations i.e. Rengali, Burla and Mukhiguda.

12. GEDCOL has planned to set up 10 MW solar power project and has engaged IFC as transaction advisor. GEDCOL has also planned 50 MW power generation at Manmunda and have approached IDCO for 300 acres of land.

Development of Biogas and manure management [ENERGY/KP/10]

Biogas and manure management programme has been a successful endeavor of the state government. 225954 numbers of biogas plants have been installed till 2011-12 and 7002 units by 2012-13. Plans are being made towards implementation of 6500 biogas units. Training and capacity building exercise including 80 nos of training on biogas programme and 4 numbers of construction cum maintenance training on biogas programme are planned.

Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Energy Sector	1311.83	757.65	554.53
Climate change related	509.40	367.48	274.33

Adaptation	0.00
Mitigation	509.40
Both	0.00
Total	**509.40**

Capacity Building	5.83
Investment	503.56
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.01
Research Study	0.00
Total	**509.40**

Total emission offset

	Mitigation Activities	Unit	Pilot undertaken by (2013-14)	Planned by (2014-15)	Emission reduction (by 2013-14)	Emission reduction (by 2014-15)
Energy						
	Solar	MW	33		51,629.7	51,630
	Wind	MW				
	Biomass	MW	22	118	1,48,055	7,77,327.36
	Small Hydro	MW	57		1,64,276	1,64,276
	AT&C Loss reduction	MWH	7,43,151		6,98,562	6,98,562
	DSM and energy efficiency	MW				
	Bio-gas and manure management	No (Cumu)	2,32,956	2,39,456	3,93,696	4,04,681
	TOTAL				**14,56,218**	**20,96,476**

Fishery and Animal Resources

Importance of the sector for the State

Marine export from Orissa is dominated by brackish water prawn which has high risk due to climate change

Hardy animals in south western Odisha who withstand prolonged dry spell

Odisha is endowed with enough water resources with high inland fishery potential. It also has long coast line (480 Kms) and have significant potential for marine and brackish water fishery. There are 1.73 million marine fishermen in the state. Marine fishery production is 1.1 lakh Million Tonnes per annum. It has exported INR 793 crores value of marine products to other countries in the year 2011-12. The inland fishery production is 2.2 lakh million tones /annum (2011-12). Therefore economic and nutritional significance for the sector is quite high. Animal Husbandry is the major source of supplementary income for rural households. Livestock production has always been an integral part of the rural livelihood systems in Orissa. The predominant farming system in Orissa is the mixed crop-livestock farming system and over 90 percent of all farms of all categories confirm to this farming system. The total livestock population of the state (as per Livestock census 2007) is 24 million. The Animal Husbandry sector contributes more than 30% to the Net State Domestic Product of Agriculture.

Key vulnerabilties

Out of 30 districts, seven belongs to coastal areas with fishermen population of 8, 98,134 (Inland) and 6,05,514 (Marine). They are highly vulnerable to climate change.

The key climatic vulnerability of the sector include (a) sea level rise: this inundates the coastal fishing villages (b) sea surface temperature rise affects the pelagic species who descend to lower layers and their catch drops. (c) due to high variation of salinity some species of fish move to deep waters and some also change habitat (d) saline water ingress affects fresh water fishery as well as agriculture (d) enhanced frequency and intensity of tropical cyclones reduces the available fishing days. For the animals, the climate change induces vector borne disease related deaths and also prolonged dry period reduce dead storage for the animals. The heat stress too enhances animal mortality. Decreased availability of fodder affects the productivity of livestock.

Key priorities taken up

Early disease warning, deworming and vaccination: [FARD/KP/1]

Certain disease of livestock are aggravated due to deterioration of water quality and some worms also affect animal health due to deterioration of water. Some of these occur due to prolonged wet spell and water stagnation. Disease surveillance activities for control and containment of the vectors of contagious diseases of animals having economic and zoonotic importance like Bird Flu, Anthax etc. have been taken up systematically. Small ruminants and small animals are prone to climate hazards, deworming and vaccination infrastructure are being built at the grassroots levels and para-workers like Gomitras are being trained to handle this.

Culling of birds during bird flu- even though it is not directly climate linked, indirect linkage does exist

Promotion of green fodder and pasture development: [FARD/KP/2]

The fodder seed production farm functioning at four locations of the state namely at Tarbod, Panchmahal, Randapalli and Chipilima are being strengthened in first phase for production of planting material. The other existing fodder farms will be strengthened in phased manner. This is an important drought adaptation measure.

Green fodder cultivation

Promotion of indigenous variety: [FARD/KP/4]

Efforts are being made to promote indigenous hardy varieties of animals like cows, buffaloes and goats under Kalyani Project and Integrated Goat Development Project respectively.

Development of infrastructure for early warning system in coastal areas: [FARD/KP/7]

Apart from cyclone related warning issued by the IMD, the state Government also has access to digitized maps of the fisheries resources based on satellite imagery and information provided by INCOIS, Hyderabad to provide information to fishermen. This is one of the important adaptation initiative that reduces risks.

Welfare activities for fishermen: [FARD/KP/12]

As an important adaptation initiative the state government has covered 10,000 fishermen under savings-cum-relief scheme with an investment of Rs 28.8 lakh in 2013-14. 10 lakh fishermen were covered under group insurance scheme with an investment of Rs 290 lakh. One thousand low cost houses were provided to fishermen with an investment of Rs 500 lakh.

Budgetary allocation

Budgetary allocation for last three years is given below

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for fishery and ARD sector	825.85	447.09	402.25
Climate change related	28.33	24.69	15.41

Adaptation	28.33
Mitigation	0.00
Both	0.00
Total	**28.33**

Capacity Building	2.46
Investment	3.01
Pilot/Demo	0.00
Policy Action	6.24
Pre-Investment	0.00
Research Study	16.62
Total	**28.33**

Total emission offset

There are many ways in which methane management from livestock is possible (a) either using the cow dung etc. in bio-gas plants (b) recovering methane in modern abattoirs from carcasses. There is also possibility of composting and digestion of methane. But the last one is from a whole range of wastes and the offsets have been estimated in Urban Development Context. The bio-gas related emission offset is estimated to be 4,04,681 units of tCO_2 eqv.

Forestry

Importance of the sector for the State

Forestry sector is particularly important both from mitigation as well as adaptation point of view. Forest acts as a carbon stocks/sinks that pertains to mitigation. Benefit of forest resources like conservation of soil, water and preservation of local micro climatic condition pertains to climate adaptation. The continual degradation of the natural forest and urban plantation paves way and causes decline in the ambient air and water quality leading to health hazards.

Forestry sector provides livelihood support to more than a million people in the state. Around 25% of the state's Scheduled Tribe population are forest dependant. Livelihood of the forest dependent community is likely to be impacted under the current and the projected intensity of land use and degradation.

Mangroves act as excellent barriers against climate-induced extreme weather events such as cyclonic storms which is most predominant in the coastal region and is projected to be increased in terms of frequency. While serving as a protection to humans, this unique coastal ecosystem also acts as a carbon stock. The state has 221 sq km of mangrove in the districts of Kendrapada, Bhadrak, Jagatsinghpur, Balasore and Puri.

Key vulnerabilties

Economic growth and industrial development has imposed tremendous anthropogenic pressure on the forest reserve through deforestation and degradation. Climate variability including projection of long dry spell might exacerbate the existing stress on the forest resources disrupting the ecological balance, loss of biodiversity, loss of ecosystem and extinction of species. The climate variability might enhance stress over communities dependent on non-timber forest produce. Climate change also possess threat to wildlife as many of the species may be unable to tolerate the weather changes. Weather extremities might result in increased disturbance through fire, insects, reduced regeneration success and increased competition from exotics (vegetation, insects and diseases).

Key priorities taken up

Increasing reforestation/ afforestation activities in degraded forest areas [FOR/KP/1]

Afforestation initiatives towards increasing the carbon stock within the state have increased several folds. The total area covered under afforestation as on February 2014 was 392,759 ha and avenue plantation was 8382 RKM. Increase of afforestation and avenue plantation will result in to (a) increase the GHG sequestration (b) declining the level of air pollution (c) prevention of soil erosion (d) increased resilience of the forest ecosystem and biodiversity conservation (e) sustaining livelihood of the forest infringe/ communities depending upon the NTFPs.

Avenue Plantation are being carried out across Bhubaneswar, Keonjhar, Karanjia and Jajpur road. Block plantation are carried out across Bhubaneswar, Rourkela, Angul and Dhenkanal forest divisions.

Year	AR Plant-ation	ANR with GAP Plant-ation	ANR (SILVI)	Total	Urban Plant-ation (tree lakhs)	Avenue Plant-ation (RKM)
2013-14	24966	38023	40296	103285	10.57	4506
2011-12, 2012-13 and 2013-14	66519	68544	257696	392759	26.16	8382

Protecting existing forest stocks to act as carbon sink with stronger conservation [FOR/KP/2]

Initiatives are being undertaken towards protection of existing forest cover and carbon stocks of the state. Forest protection squads have been constituted and engaged under various schemes. These squads are deployed over vulnerable locations of different forest divisions and work in close proximity with forest officials in protection duties. The details of the initiatives undertaken are given below.

FY	Scheme	No of Forest Squads	No of Person Engaged
2011-2012	State Plan IPCEA	37	370
	State Plan 13 FC Grants	37	370
	CSP- IFM	19	190
	Deposited Scheme CAMPA APO 2010- Para Forest Force	10	1110
2012-2013	State Plan IPCEA	37	370
	State Plan 13 FC Grants	74	740
	Deposited Scheme CAMPA APO 2010- Para Forest Force	14	1167
2013-2014 (up to Nov 13)	State Plan IPCEA	37	370
	State Plan 13 FC Grants	74	740
	Deposited Scheme CAMPA APO 2010- Para Forest Force	32	922

Increasing planting on non-forest land and also exploring where new and increased tree planting could create barriers to storm and cyclone impacts in coastal zones [FOR/KP/3]

With the objective of increasing the total carbon stock initiatives are being taken to promote plantations in the non-forest land/ tree outside forest. Such actions will facilitate lowering of the urban pollution load, prevent desertification and improve micro climatic conditions. Actions are implemented by distributing seedling to public and farmers. This ensures greening outside traditional forests and supporting environmental cause. Seedling distribution for plantation outside forest are facilitated under state plan scheme under 13th FC grant are as follows:

FY	No of Seedling distributed (in lakhs)
2011-12	186.78
2012-13	199.46
2013-14 (up to Nov 2013)	299.52

Mangrove plantations are initiated to reduce the detrimental impact of natural disaster in the coastal areas that are likely to increase as a consequence of the climate change. The mangrove plantations also act as add on to the existing forest sink in terms of sequestration of carbon-di-oxide. The mangrove plantation undertaken by the department/agency are as follows:

FY	Schemes	Area planted in hectare	No of Seedling distributed (in lakhs)
2011-12	CP/OFSDP	535	13.38
2012-13	CP/OFSDP	343	8.58
2013-14 (up to Nov 2013)	CP/OFSDP	10	0.25
	WLProtection (Mangrove)	9	0.02
	ICZMP	49.70	1.26
	CAMPA(CA)	2.4	0.06

Covering Bald-hills with suitable species mix [FOR/KP/4]

Initiatives are taken to increase plantation in the scrub land across the state that are mostly bald hills devoid of appreciable forest growth and are the most vulnerable mountain patches for soil erosion and accelerated soil loss. Plantation of suitable species will counter desertification and prevent soil erosion during flood and other weather extremes, etc. Species like Simul, Simaruba, Sana Chakunda, Acacia, Sitapala, Neem, Sisris, Bahada, Cashew, etc. are some of the common species planted under the programme. The initiative undertaken is as follows:

FY	Schemes	Area planted (in hectare)	No of Seedling planted (in lakhs)
2011-12	SP Bald hill plantation	500	800,000
2012-13	SP Bald hill plantation	510	816,000
2013-14 (up to Nov 2013)	SP Bald hill plantation	600	960,000
	CAMPA APO 2012-13	1000	1,600,000

Assessing fire management strategies [FOR/KP/6]

Forest fire are recognized as the major cause of forest degradation in the state (the cause include natural and manmade; the types of vegetation and sustained dry period are the natural causes linked to climate change). Institutional tie-up is developed with FSI, Dehradun for day to day fire monitoring using MODIS satellite data and infrastructure are put in place to verify the same on field as soon as it is being detected and communicated through mobile communication. Arrangement is created to swiftly extinguish the forest fires by involving firefighting squads and equipment. The action undertaken are as follows: (a) creation of fire protection squad (b) incentives to local communities/VSS for fire prevention and control (c) fire

line maintenance (d) monitoring and fire mapping (e) Hiring of vehicle for fire protection squad (f) Procurement of firefighting equipment for each squad.

Improving tree planting and forest management to integrate with watersheds and water resources management [FOR/KP/7]

Improved tree plantation is taken up in the watershed area as a soil conservation and water retention method. Plantation are initiated under 13th FC Grant Scheme and Annual Plan Operation through CAMPA. Total area covered under SSO timber and SSO bamboo for FY- 2011-12 and 2012-13 are 1,56,513 ha and 1,57,666 ha respectively along with an area of 49,083 ha under ANR Silviculture. A target of 40000 ha of plantation under SSO timber has been enmarked for 2013-14.

CM planting a tree in a school with children

Working to establish new systems to support for user community [FOR/KP/8]

Climate change is projected to impact the natural ecosystem including the forest reserve. Forest that acts as source of livelihood might exacerbate the vulnerability of the communities that depend totally on the natural resources. Therefore actions are being initiated to enhance the capacity of the communities to manage risk through sustainable forest management plan. One of the endeavors is to establish a new system to support the community users towards honey collection. 120 quintal of honey has been collected in the year 2013-14.

Forest fire a consequence of prolonged warming

Capacity building of JFM & CFM Committees and Panchayati Raj Institutions to adapt to climate change [FOR/KP/12]

The Vana Samrakhsyana Samitis (VSS) and Eco-Development Committees (EDC) have been empowered through Joint Forest Management Resolutions to protect forests adjoining the villages. The JFM committees were made responsible for protection, conservation and regeneration activities while the control of non-timber

A JFM programme in progress

forest produce has been transferred to Panchayats. The state has formed 12,166 numbers of VSSs and 463 Eco Development Committees to manage forest fringe areas in Joint Forest Management Mode.

Monitoring carbon stock and biodiversity at regular intervals [FOR/KP/13]

The forest which acts as a carbon sink and store house of biodiversity is required to be monitored to gauge the success of various programme implemented. The growing stock is being monitored at regular intervals through the Forest Survey of India (FSI) and biodiversity assessment are being conducted by institutions like Regional Plant Resource Centre (RPRC), Wild life wing of the Forest department, Odisha Forestry Sector Development Project (OFSDP), Chilika Development Authority (CDA), etc. Forest Department is also taking up studies like NTFP survey and biodiversity assessment & growing stock estimation of natural forests through working plan exercise. The afforestation activities of the entire state are being monitored departmentally with help of modern tools & techniques like DGPS survey, Google imageries & e-green watch, etc.

Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Forest and Environment	716.01	665.19	589.98
Climate change related	554.59	310.05	246.39

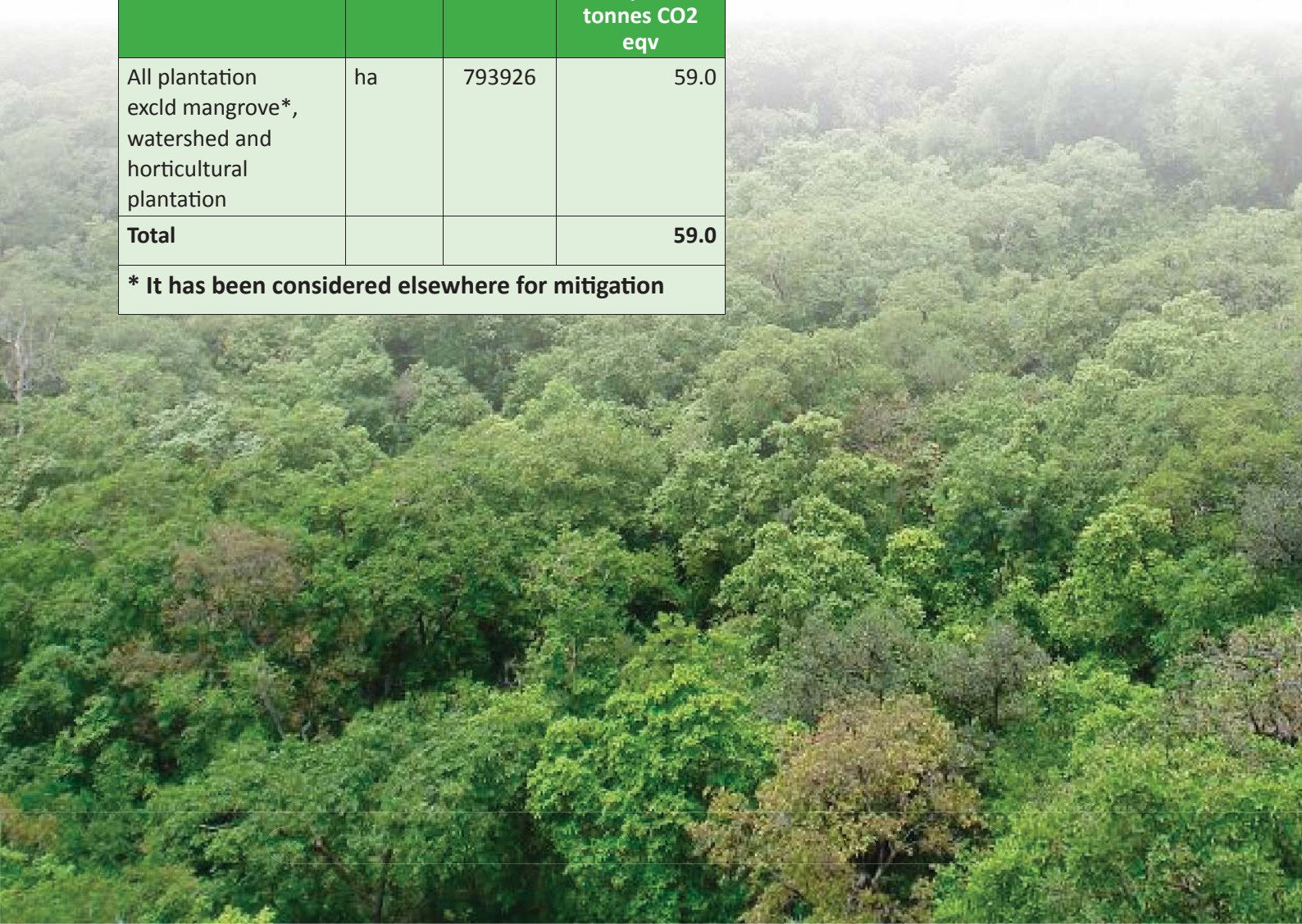
*The figures as reported to the cell

Adaptation	60.00
Mitigation	254.59
Both	240.00
Total	**554.59**

Capacity Building	3.00
Investment	528.59
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	20.00
Research Study	3.00
Total	**554.59**

Total emission offset

	Unit	By 2014	Emission reduction (by 2014) in mn tonnes CO2 eqv
All plantation excld mangrove*, watershed and horticultural plantation	ha	793926	59.0
Total			**59.0**
*** It has been considered elsewhere for mitigation**			

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Health

Importance of the sector for the State

The health conditions of the people impact the level of participation and ability to work, earn livelihood and contribution to the development of the society. Weather variability and extremes are likely to pose serious threat to the public health at large. With clear proof of climate change due to global warming, there is serious apprehension of the upsurge in morbidity and mortality due to increased heat, air pollution effects, impacts ex-post extreme events, malnutrition, water and vector-borne diseases. There are significant social, regional and gender disparities in accessing public health in Odisha. Interior regions in general and tribal districts in particular have poor physical and economic access to health services. These regions also bear the brunt of a resource crunch both in terms of a health budget deficit and neglected public health institutions. Health conditions depend on a number of factors including: (i) income and poverty levels, (ii) food security, food pricing and malnutrition, (iii) availability of professional medical attendants, paramedical professionals, quantity and quality of health infrastructure(iv) socio-economic development, literacy and health awareness, and (v) physical and economic accessibility of private or public healthcare system. Odisha has been making sustained efforts to improve its health situation. The private healthcare system is generally

less developed in interior areas and is not economically accessible. Low female literacy levels adversely impact reproductive child healthcare in tribal and other interior areas.

Key vulnerabilties

Already stressed health scenario especially across the rural and tribal areas is likely to be exacerbated due to the projected impact of climate change. Changes in temperature and rainfall pattern and increased humidity are likely to change disease patterns of the water and vector borne diseases. Important vector borne diseases that might be affected by the climate change includes malaria, lymphatic filiariasis, dengue and other arbo-viruses such as chikungunya and Japanese encephalitis. At the same time some new infections are also expected to upsurge or express different dynamism with changing climate and they are visceral leishmaniasis, west nile virus infection and zoonotic diseases like tick borne encephalitis and plague. The level to which the people will be affected will depend upon their locations and level of preparedness. People residing in rural and tribal areas and hilly terrains of the state will be more vulnerable to malaria. People residing in coastal regions and plain area will be more under risk of dengue and chikungunya. In all the above populations, children under five years and pregnant women are expected to be the most vulnerable. Food production may be adversely affected and create pockets of hunger and malnutrition. With the likely increase in the intensity and frequency of extreme weather events, there may be significant post-event human health issues to reckon.

Key priorities taken up

Strengthening approaches to manage vector borne disease that have worsened due to climate change impacts [HEALTH/KP/3]

Strategies are being planned to respond to the anticipated vector borne diseases upsurge due to climate change.

This includes:

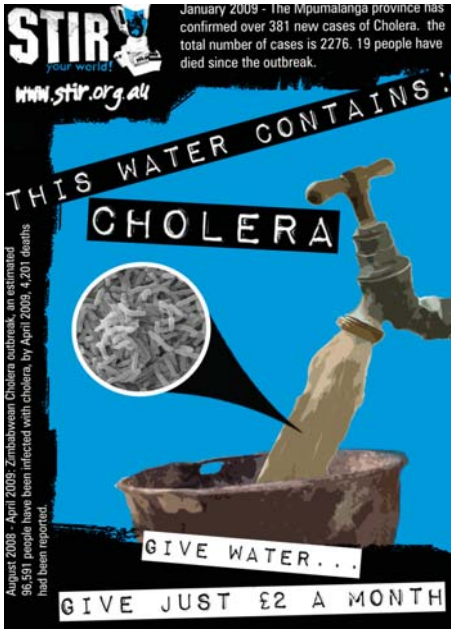
Strategies	Methodologies	New intervention
Early Diagnosis and complete treatment	Strengthening existing diagnostic facilities and establishing facilities for new diseases. Exercising right treatment for complicated diseases Strengthening surveillance system for capturing maximum positive cases	Engaging volunteers to perform as FTDs in villages in absence of ASHA. Additional sentinel sites for dengue diagnosis Functionalizing sentinel sites for JE diagnosis
Integrated Vector management	Improve environmental sanitation Larval control : chemical and biological control Control of adult mosquito Personal prophylaxis	Additional volunteers for expediting sanitation drive in dengue sensitive areas Construction of larvivorous fish hatcheries Improved monitoring of MPHS Construction of soakpit for proper disposal of insecticides Development of lab facilities for advance diagnosis of virus in mosquito and blood samples.
IEC & BCC	Development of specific health message Dissemination of IEC message	Development of intervention specific IEC message and dissemination through NGO/PPP mode
Capacity building	Capacity building of the health functionaries	Training and orientation of FTD

Surveillance for vector borne diseases

Strategies	Methodologies	New intervention
Monitoring and Supervision	Strengthening capacity of the health monitoring system Promoting effective engagement of health sector to reduce risk Adoption of inter - sectoral initiatives via assessment of the health implication of other sector effort	Involving MPHS in monitoring of VBV control activities.
Risk assessment studies: Entomological and epidemi-ological	Conducting regular studies on vectors and their vectorial attributes for generating new early warning signals and proper programme guidelines for effective management of VBDs	Regular studies on malaria vector Studies on dengue vectors during inter epidemic periods and outbreaks Conducting entomological and epidemiological studies in JE suspected areas to verify the link of various risk factors
Operational Research	Impact evaluation of IEC messages on community behavior change Impact assessment of various control interventions Advocating for decisions that provide opportunities for improving health	Collaboration will be made with the following agencies TMST, ICMR institutes, Veterinary institutes and apex referral labs for advance diagnosis of serotypes and genotypes viral strains. The above research will help in evidence generation and strategy modification

Strengthening approaches to deal with heat wave conditions exacerbated due to climate change [HEALTH/ KP/4]

Hazards like heat stroke/ heat exhaustion/ heat syncope/ cramp may lead to disability/ death in a short span of time.



Therefore urgent case management and establishment of referral mechanism has been established to reduce the morbidity and mortality due to heat wave changes. Heat stroke room are being developed at DHH/SDH/CHC with separate rooms with enmarked AC facility starting from medical colleges to PHC level for immediate case management. Plan is being made towards mapping of heat wave prone areas and sensitization of the people over occupational health hazards along with sensitization of health care providers to upscale their knowledge.

Undertaking measures to manage water borne disease that have worsened due to climate change impacts [HEALTH/KP/7]

Odisha is prone to epidemics due to water borne diseases like diarrhea, dysentery, typhoid and hepatitis. Plan is being made to reduce and counter the spread of these diseases and also reduce morbidity and mortality from the same:

1. Identification and mapping (GIS mapping) of diarrhea prone areas and vulnerable groups.
2. Imparting skill based training to medical officials and paramedical workers.
3. Developing and training of district as well as block level rapid response teams for outbreak management.
4. Disease surveillance.
5. Outbreak preparedness and response.
6. Laboratory and Environmental surveillance.
7. IEC activities towards increasing awareness about personal hygiene, environmental sanitation especially in the tribal dominated district.
8. Increased quality monitoring and supervision.
9. Timely availability of drugs and logistics in minimizing the cases and death during outbreaks.

Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Health Sector	3,897.74	2192.18	1811.91
Climate change related	36.10	30.03	0.00

*The figures as reported to the cell

Type of Project	Budget (in Cr)
Adaptation	36.10
Mitigation	0.00
Both	0.00
Total	**36.10**

Nature of Project	Budget (in Cr)
Capacity Building	30.00
Investment	3.10
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	3.00
Total	**36.10**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AMBULANCE
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NATIONAL RURAL HEALTH MISSION
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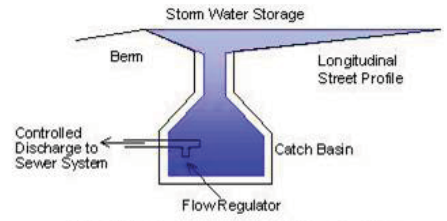
Housing and Urban Development

Importance of the sector for the State

According to Provisional Population Totals (rural-urban distribution) for Orissa, 16.68 per cent of state's total population reside in towns. An increase of 3,66,3,812 in rural population and 14, 78,886 in case of urban population has been recorded as compared to 2001 census. An estimated 83.32 per cent of Orissa population live in villages. Even though a large percentage of population are in villages, several growth centres such as Kalinganagar in Jajpur, Jharsuguda, Sambalpur, Anugul, and greater Bhubaneswar (part of Khurdha, Puri, Nayagarh, Cuttack), Ganjam and Jagatsinghpur districts are showing rapid urbanization in satellite areas. However, the urban decadal growth during the last decade (2001-2011) has been enormous (about 26.09 percent), almost matching that of the country, which had an urban decadal growth rate of 32.60 percent. It is noteworthy that the State's population during the last decade has grown by about 14 percent while that of the urban population has grown at almost at double this rate. The priority of the state government is reflected in the quantum jump made in budgetary allocation for urban development in Odisha, which has nearly doubled. Based on the budget allocation and re-appropriation for the FY 2013-14 a major thrust of H&UD Department is on improvement of urban governance, urban infrastructure and urban poverty alleviation.

Key vulnerabilties

Rapid urbanization and the growth of urban clusters especially areas adjoining to Cuttack, Bhubaneswar and Puri have led to the emergence of highly vulnerable urban communities, particularly through informal settlements and inadequate land management. Coastal cities in districts of Ganjam, Puri, Jagatsinghpur are also likely to be impacted by enhanced frequency and intensity of tropical cyclones due to climate change. The availability of fresh water in some areas of Ganjam is already a problem. In some emerging cities in Jajpur, Jharsuguda, Angul, there are signs of deteriorating air quality and water quality. There is also resource congestion and limited options of developing modern road and sewerage network in old cities of Cuttack and Puri. This has led to health hazards, traffic congestion and air pollution. Rapid development of built environment, shopping complexes and high rises also contributed to increase in ambient temperature and higher quantum of waste/unit area.



Catch basins can be equipped with flow restrictors to temporarily detain stormwater in the conveyance system

City Flooding in the outskirts of Bhubaneswar and a storm-water schematic

Key priorities taken up

The following paragraphs shows the key adaptation and mitigation actions taken up in this sector.

Reduction in non-revenue water loss: [HUD/KP/3]

Safe water availability in the cities are becoming increasingly scarce. To improve water governance an Odisha Urban Water Supply Policy 2013 has been notified. Government is investing heavily on creating an e-governance system to ensure universal metered coverage. Physical coverage of distribution network shall be ensured across the city area with provisions for future demand in fringe growth areas. The water supply system master plan for the city shall be followed for initiating the expansion proposals. Household level coverage shall be given more importance with house connection in covered area made mandatory. No house connection shall be provided from transmission or feeder lines. Institutions like hospitals, schools, anganwadi Kendra, bus stop and other public places shall be provided with piped water

supply on priority. All water shall be accounted for. A metering regime shall be operationalised in a progressive manner to achieve 100% consumer level metering. All bulk production including ground source, transmission and distribution flow shall also be measured with a reliable data capture and reporting mechanism. Total budget committed for 2014-15 is about Rs 12 crore.

Municipal Solid Waste Management: [HUD/KP/4]

To tackle the challenge of collection, transportation and safe disposal of Municipal Solid waste for keeping cities and towns clean, healthy and hygienic, the state Govt. has taken steps to allot Government land free of cost for creation and O & M of Solid Waste Management Land Fill Sites with community involvement. It has been proposed to cover all class-I cities of Odisha under integrated Municipal Solid Waste Management projects on PPP mode with financially sustainable O & M plans. Out of 60 wards, Bhubaneswar Municipal Corporation has outsourced collection, transportation and dumping of solid waste, along with road/street sweeping and bush cutting in 40 wards to 4 different agencies. Cuttack Municipal Corporation has implemented integrated Municipal Solid Waste Management Project. The conservancy activities of 36 wards are outsourced whereas 18 nos. of wards are cleaned by CMC workers. The open garbage points existing earlier have been replaced by dumper placers and compactor bins in all 54 wards of CMC for mechanized transfer of garbage by D.P. vehicles and compactors. Total allocation for solid waste management is about Rs 174 crore in Bhubaneswar, Cuttack, Sambalpur, Paradeep and Ganjam (the last two are being supported by the World Bank and IFC).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Berhampur waste managament PPP

Energy efficient street lighting system: [HUD/KP/5]

In September 2011, BMC had signed a memorandum of understanding with the International Finance Corporation to prepare the detailed project report for energy efficient street lighting. The report contained a number of features to decrease the consumption of electricity through energy conservation. It suggested installation

of timer machines and dimmers on electric poles to conserve energy. This apart, the report also stated that energy efficient transformers along with light-emitting diode bulbs would replace the older ones. It is one of the biggest street lighting project (30000 lights). BMC in its annual budget for 2013-14, had allocated Rs 5 crore as a corpus for energy efficient street-lighting system. The project aims to generate annual savings to government of $100,000; mobilized $4.8 million in private sector investment; will reduce greenhouse gas emissions by an estimated 10,500 tCO_2eq annually. The project is being executed in PPP mode and ESCO route.

Solid waste dumping

Preparation of City Development Plan: [HUD/KP/6]

The City Development Plans (CDP) have direct linkage with sustainable habitat mission. Under city development plan 106 master plans will be prepared. In 15 selected ULBs special focus will be on climate change. There will be spatial mapping for hazards and various mitigation and adaptation measures will be planned. Massive awareness programme under the capacity building component has been planned. The CDPs are required to cover water supply, waste management, waste water management, energy efficiency and mobility plan. Amount committed is INR 4.9 crore for 2014-15.

Water metering and e-governance

Bus Mass Rapid Transit System: [HUD/KP/7]

State has been operating wide-body city bus services under JNNURM as well as bus services between Cuttack and Bhubaneswar agglomeration. Even though there is no separate right of way is given it has potential to significantly reduce private vehicle mobility. The climate benefit of the system can be summarized as below:

(a) Induced modal shift to BRT from more emission-intensive modes like private motorized transports like cars, autos (b) Increased fuel efficiency due to increase in mixed traffic speeds (c) significant increases in overall traffic speed can be achieved by removing many frequent stop buses. 60% of the buses are of limited stoppage (d) Reduced vehicle kilometres travelled due to rationalised

Bus Mass Rapid Transit System

routes and connects both economic areas and fringe (e) Increased fuel efficiency of buses due to improved transit vehicle speed (f) Improved bus fuel efficiency because of new buses, so far the scrappage of old buses have not been introduced.

In India 8 cities have introduced BRT system and carry 3 million passengers per day. Bhubaneswar is not one of them. Large capacity buses with right of way with pre-boarding and ticketing facility can reduce CO_2 emission in the range of 150,000-200,000 per year. Rs 161 crore has been provided for such initiative. This will involve further survey and improvement of city mobility plan.

Storm water drainage: [HUD/KP/9]

The State Govt., under JNNURM (UIG) has undertaken implementation of the storm water drainage projects in the mission cities of Bhubaneswar and Puri at an estimated cost of Rs.140.15 Crore for constructing and developing main natural storm water drains to drain out rain water and reduce incidents of water logging during rainy season. Work has started in 4 Nos. of main natural drains in Bhubaneswar city and 5 Nos. of drains of Puri town.

Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Housing and Urban Development	3031.65	2385.46	1575.99
Climate change related	502.12	0.00*	0.00

*Business as usual activities have been taken up in 2013-14 but not reported as per SAPCC.

Type of Project	Budget (in Cr)
Adaptation	160.64
Mitigation	341.48
Both	0.00
Total	**502.12**

Nature of Project	Budget (in Cr)
Capacity Building	4.35
Investment	319.95
Pilot/Demo	0.00
Policy Action	12.00
Pre-Investment	165.82
Research Study	0.00
Total	**502.12**

Total emission offset

	Unit	By 2014-15	Emission reduction (by 2014-15)
Energy efficient street lighting	No	30,000	10,500
MSW (for Cuttack, Puri, Bhubaneswar)	Tonnes	1,76,400	114,660
Total (tCO_2eq)			125,160


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Industry

Importance of the sector for the State

Industrial growth has fostered economic development across the state and is contributing substantially to the Gross State Domestic Product (GSDP). With an enabling environment, sustainable policy and institutions in place industrial sector has grown several folds in last few years. Industrial growth has in turn spurred employment generation, revenue augmentation, growth of service sectors and ancillary units. In terms of employability, the total engagement in 3396 numbers of registered factories in 2010-11 alone is around 282,860 and in 117361 SSI/ MSME units is 30,387.

Irrespective of the global economic slowdown and disruption in mining related activities, the state is still receiving heavy investments in the industrial sector with potential big-ticket new entrants. Other than the large scale iron and steel, aluminum units, the state's industrial growth in micro, small and medium enterprises has been substantial. However it is imperative to outline in this context that the industrial facilities in the state are mostly manufacturing with higher energy (both in primary as well as secondary form) requirement. It is therefore important that carbon conscious industrial development be planned so as to enhance the environmental sustainability.

Key vulnerabilties

The functioning of industry is not directly linked with weather variability but it is most likely to be impacted. Water stress is already perceived in most of the major industrial destination across the state and is likely to be exacerbated. Such situation might enhance the operational cost or hamper production. Climate extremes / disaster might impact the industrial infrastructure especially in the coastal region and hence it is desirable that appropriate planning be in place to cope with weather extremes. Moreover the concern over the heat island effect and increase in ambient temperature across Talcher-Angul and Jharsuguda area might impact the industrial work force unless adaptive plans are implemented.

Rain Water Harvesting Management

Key priorities taken up

Integrate climate concerns in policies and plans for industrial development and related areas [IND/KP/1]

Plan is framed to modify the Industrial Policy Resolution (IPR), 2008 by incorporating the necessary changes and is as follows:

1. All industries will have rain water harvesting structures and the same be notified through the concerned departments through policies. Mechanism are to be devised for compensatory water harvesting and storage structures in and around the industrial areas/clusters.

2. Policies to be framed up through stakeholder's consultation to address the issues of energy efficiency and waste management. Actions including energy audits, establishment of common effluent treatment plant are some of the proposed measures.

3. Encouraging manufacturing of fly ash bricks and tiles and other building materials. Using of industrial waste for productive use. Sheds/lands may be provided as part thereof within the industrial estate at concessional rates.

4. Industries to be insisted /encouraged to set up ancillary units to promote bulk use of industrial waste generated by them.

5. Industries to take necessary steps to prevent, contain and effectively deal with industrial disasters in collaboration with OSDMA.

Prepare GHG profile of major industrial cluster [IND/KP/2]

GHG profile of industrial sector of Odisha was prepared by SPCB on the basis of capacity of different industrial category and mines and the emission factors prescribed by IPCC. An updated report "Carbon Footprint of the State' is being prepared by F&E Department in association with CII. The State Pollution Control Board is also in the process of updation of the GHG profile. A working group has been formed to develop fiscal instruments to create mechanism to incentivise the industries undertaking energy efficiency measures. Perform Achieve and Trade (PAT) scheme for energy efficiency for iron and steel sector is also in operation in the state.

Heat-island study for Talcher and Jharsuguda area[IND/KP/3]

SPCB, Odisha has contacted institutes of national repute to undertake the heat island study. Centre for Atmospheric Science, IIT Delhi have responded to the call and requested time for drafting the roadmap towards undertaking the study.

Training various stakeholders on climate change issues[IND/KP/4]

Training modules are prepared by State Pollution Control Board and the same is being currently undertaken by the department at 12 different locations with target groups comprising of industrial houses, NGO, students, researchers and citizen forum. The broad area of training includes:

1. Biodiversity and Climate Change
2. Impact of Climate Change on Natural Resources
3. Climate Change Mitigation measures
4. Policy Approach on Climate Change
5. Technological advance for conservation vis-à-vis Climate Change
6. Clean Development Mechanism

First waste heat recovery project from Odisha (OSIL) that was registered under CDM

Carry out energy efficiency study for iron & steel, thermal power, cement and aluminum sector [IND/KP/7]

The nodal department State Designated Agency (SDA, Odisha) is in the process of facilitating energy audit across the industrial units. Unit wise specific energy consumption is estimated for 28 industrial units (designated consumers) across 5 sectors and targets for specific energy consumption is also set for the industrial facilities categorized as designated consumers.

Energy Audit

Promote use of bulk waste material like fly ash, dolochar, slag etc. [IND/KP/8]

The State Pollution Control Board is facilitating disposal of industrial solid waste. A Fly Ash Resource Centre (FARC) is established and operationalized to co-ordinate with various agencies to use industrial wastes generated in large volume. Plan is being made to create awareness on the benefits and use of fly ash and fly ash based products so as to increase its acceptability. Plan is there to include necessary amendments in IPR and sanctioning/ clearance procedures to encourage use of fly ash as well as other industrial waste.

Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Industries Sector	113.28	97.74	68.62
Climate change related	70.5	0.18	0.00

Type of Project	Budget (in Cr)
Adaptation	56.50
Mitigation	14.00
Both	0.00
Total	**70.50**

Nature of Project	Budget (in Cr)
Capacity Building	34.50
Investment	0.00
Pilot/Demo	0.00
Policy Action	30.00
Pre-Investment	4.00
Research Study	2.00
Total	**70.50**

Mining

Importance of the sector for the State

Mining is the prime mover of industrial development and power generation in the state and contributes to the tune of 7.5% of state's real GDP. Its contribution to industrial sector alone is around 25%. The state is endowed with large varieties of minerals which include chromite, bauxite, graphite, iron ore, manganese ore, limestone, clay, quartz and quartzite, nickel, copper, lead, coal and many precious stones. Within the state, coal constitutes the major share (88%) of mineral deposits followed by iron and bauxite. The mining sector has maintained an annual average growth rate of 4.86%. Mining sector also acts as key source of livelihood. A total of 48249 numbers of persons were employed in the mining sector in 2011-12.

However the detrimental environmental impact due to mining or quarrying process cannot be undermined. This includes the air pollution impacts (particulates), water pollution (mine water discharges), social impacts (displacement and rehabilitation) and forest degradation (part of the mining area is in the forests or in the vicinity). Mining activity also contribute to greenhouse gas emission directly for example release of coal bed methane or indirectly due to combustion of fossil fuel used in the process of mining or quarrying.

Key vulnerabilties

The key vulnerability that the mining sector is likely to face is from climate extremes like flood that has potential to cease the mining operation or damage the existing mines. Increased temperature or disease outbreak might forbid the continuing operation of the mining sector. However, operating mines beyond carrying capacity of the area will destroy the eco-system of the area.

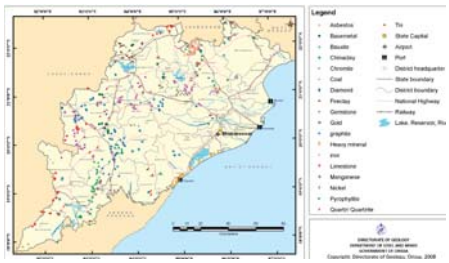
Key priorities taken up

Conduct a study to identify the potential of beneficiation of low grade iron ore, manganese, graphite and chrome ore [MIN/KP/3]

After the re-fixation of the threshold values of ores / minerals in 2013-14, the lessee and the processing industry have shown keen interest to utilize low value minerals. IBM Bhubaneswar has collected the sample of chrome ore tailings from the beneficiation plants of Sukinda valley and sent to Nagpur for taking up beneficiation studies. It was suggested that beneficiation studies on low grade ores/ minerals should be taken up by IMMT and these studies should cover assessment of existing methodology and development there upon.

Establish a robust system of environmental monitoring in major mining clusters [MIN/KP/4]

State Pollution Control Board in assistance with The World Bank has prepared a road map for monitoring of environmental parameters in the mining clusters. A voluntary disclosure format (in the line of carbon disclosure project for industries) is being worked out. Apart from this in association with Transport department movement restriction of dirty cargo in road route is also being worked out and waterway can be used for bulk transport. A DPR is being prepared with RITES acting as advisor.



Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Mining Sector	78.69	65.08	38.08
Climate change related*	0.00	0.00	0.00

*The department deposits requisite money with Forest and Environment department for plantation

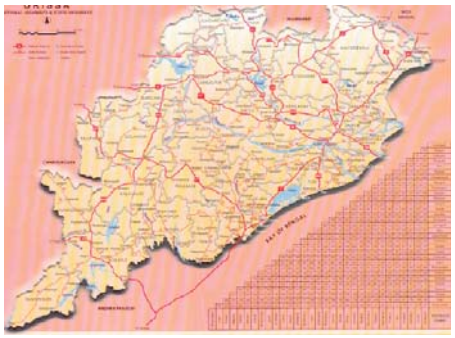
Type of Project	Budget (in Cr)
Adaptation	0.00
Mitigation	0.00
Both	0.00
Total	0.00

Nature of Project	Budget (in Cr)
Capacity Building	0.00
Investment	0.00
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	0.00


SRIMUR

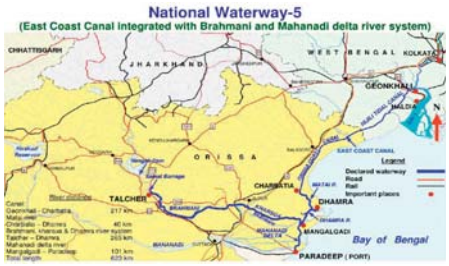
Transport

Importance of the sector for the State



Transport is the crucial component in the development process and economic growth. It plays pivotal role in improving efficacy and productivity across social and industrial sectors, connects human settlement with growth and service centres. The state government has therefore accorded high priority to develop the transportation infrastructure. The lack of efficient public mode of transport and adequate rail network is a persistent drawback for transport infrastructure in the state. In the absence of an adequate rail network in Odisha, roads are crucial in providing connectivity to all habitations. The State has a total road length of 2,50,328 km by the end of 2011-12. Two-wheelers alone constitute 80.6% of total vehicles on roads, followed by car/taxi and jeep 6.6% and goods vehicles 5.5%. The number of vehicles plying on roads in Odisha has increased significantly in recent years. During 2011-12, 13,565 buses, both public and private were operating indicating 29 buses per one lakh population. The railways network within the state is below the national average, i.e. an average railway route length of 15.03 km per 1000 sq km as against National average of 19.0 km per 1000 sq km. Railway routes pass through 23 districts of the State excluding Boudh, Deogarh, Kandhamal, Kendrapara, Malkangiri, Nabarangpur and Nayagarh. The density of coverage is relatively high in

some regions of the State, while central parts of the state remain largely untouched. Less railway network implies more pressure on the road infrastructure. Being on the coast, Orissa handles materials through its ports. The largest is the Paradip port, which handles about 57 MT annually. Substantial part of export/import cargo move by road. Inland water transport have small presence in the state. However the worst part of the transport sector is its contribution to climate change cause (combustion of fossil fuel results into GHG emission) and air pollution.



Key vulnerabilties

The projected impact of climate change does not have any direct relevance to transportation sector. However the climate extremes like flood, storm and cyclones might damage the road and rail infrastructure especially in the coastal belt.

Unorganised traffic movement in Berhampur

Key priorities taken up

Survey of ambient air quality of Towns/ Cities [TRANSPORT/KP/10]

Ambient air quality study is being initiated across 14 cities and towns by State Pollution Control Board. Four parameters viz, suspended particulate matters, sulphur-di-oxide, oxide of nitrogen and Respirable particulate matters are being monitored continually. Monitoring reveals the concentration of sulphur-dioxide and oxide of nitrogen within the prescribed limits. Only the particulate matters concentration are observed to be high in few of the area. A budget of Rs 1.2 crore has been placed with State Pollution Control Board for the purpose.

Traffic snarl in Rajmahal (Bhubaneswar)

Avenue tree plantation for carbon sequestration. [TRANSPORT/KP/12]

Avenue plantation is being facilitated by the State Forest Department. Increased plantation will reduce the greenhouse gas that are being emitted due to operation of vehicles. The avenue plantation across the last three years are as follows:

Financial Year	Avenue Plantation (in RKM)
2011-12	769
2012-13	3107
2013-14	4429

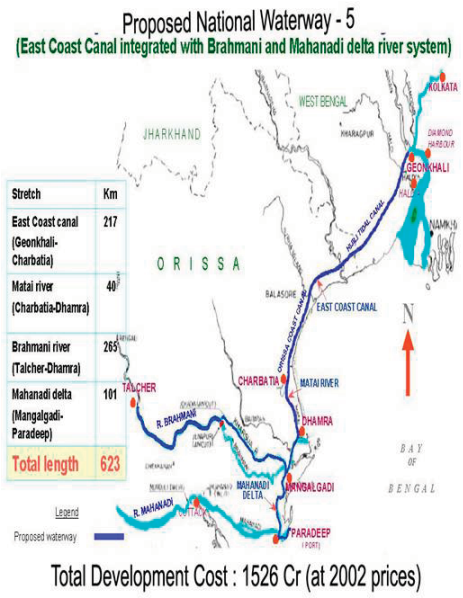
Commissioning study of Estimation of carbon emission from transport sector [TRANSPORT/KP/13]

Carbon footprint study has been initiated by Forest & Environment Department through CII. The draft report is ready. The report shows that the energy, transport and industrial sector carbon footprint has grown substantially since the last estimated figure in 2010.

Developing Inland Waterways [TRANSPORT/KP/14]

Inland water transport (IWT), including rivers and canals is an important alternative and environmentally friendly way of transport system. Efficient and viable inland water transport system, if planned and developed taking ultimate advantage of this safe and sustainable mode of transport can reduce considerable amount of carbon footprint. The directorate of IWT has taken up feasibility study during the year 2011-12 and 2012-13 with a total cost of INR 81.45 lakhs for operation of passenger motor launch service in five routes viz, Balasore- Chandipur, Rajnagar-Aul, Aul-Ayatpur, Aul-Singhpur, Balabhadrapur-Nuagarh. Out this three water routes were found viable viz, Aul-Ayatpur, Aul-Singhpur and Rajnagar-Aul for plying passenger lunch service. The directorate has procured one 50 seaters and three 30 seater FRP Passenger boats for augmenting passenger lunch service during 2013-14 at a cost of INR 93.00 lakhs.

Government of India has cleared waterway (National Waterway No.5) proposal in Talcher-Dhamara stretch of Brahmani river, Kharasua-Dhamara River system along with Goenkhali-Charbatia stretch of east coast canal, Charbatia-Dhamara stretch of Mateiriver and Mahanadi delta river system between Mangalagadi and Paradeep.



Slow progress of National Inland waterway project

Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Transport Sector	251.56	157.83	52.92
Climate change related	0.00	4.22	1.16

Type of Project	Budget (in Cr)
Adaptation	0.00
Mitigation	0.00
Both	0.00
Total	0.00

Nature of Project	Budget (in Cr)
Capacity Building	0.00
Investment	0.00
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	0.00


TATA
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Water

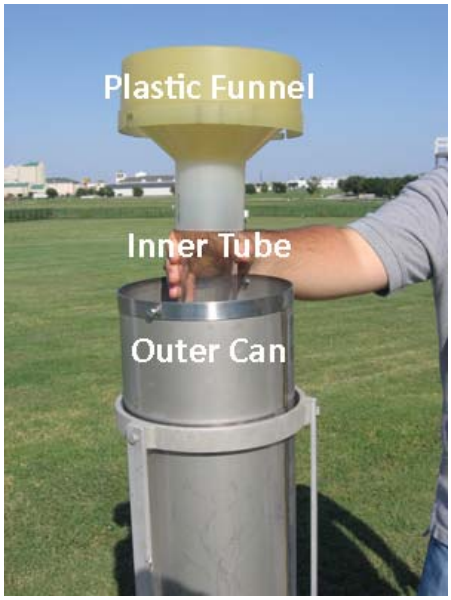
Importance of the sector for the State

Economy of the state relies largely on the water intensive sectors like agriculture, horticulture, industrial activity and energy generation. The projected disturbance of the hydrological cycle coupled with rise in temperature are likely to enhance the current constraints on water availability due to the surging population, growth in mining and industrial activity, agricultural activity and urban requirement. Increased water requirement across various sectors will have significant impact on per capita water availability. Anthropogenic activities like discharge of untreated/partially treated industrial and municipal waste, over use of water by the industrial and agricultural sector will make the resource further scarce. Many of the surface water bodies that has acted as a water reserve is hit by rapid urbanization, industrialization and mining activity including shrinkage, encroachment and deterioration of the water quality.

Apart from the long coast line, the total geographical area of (155,707 sq. km.) is divided into eleven major river basins covering a geographical area of 150,460 sq. km and minor river basin of 5247 sq. km which drains directly into Bay of Bengal. The annual overall availability of surface water is around 85.89 billion cubic meter.

Key vulnerabilties

Climate change is projected to influence the hydrological cycle of water bodies, water supply systems and exacerbate requirement of water in different regions and across the sectors. Change in the hydrological cycle may affect the spatial and temporal distribution of runoff, soil moisture and ground-water reserves. Impact of climate change on water resources is likely to be due to erratic monsoons creating variability in river flows and increased frequency /intensity in extreme events such as flood, droughts and cyclones. Drought situation coupled with increased evapotranspiration which is most likely in the water stressed region will hamper agricultural productivity impacting livelihood and food security in the state. Increased frequency of rainfall and variation in rainfall pattern including extreme events like flood will pose challenge to the society, physical infrastructure, agricultural productivity and quality.



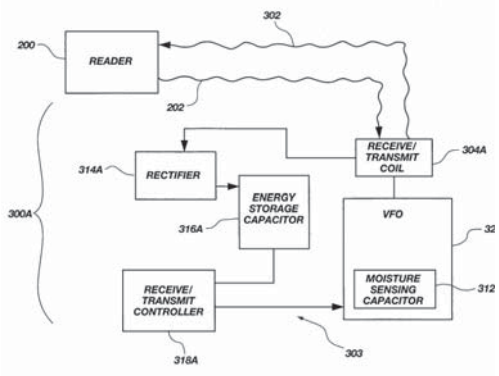
Key priorities taken up

Expansion of Hydrometry network [WATER/KP/1]

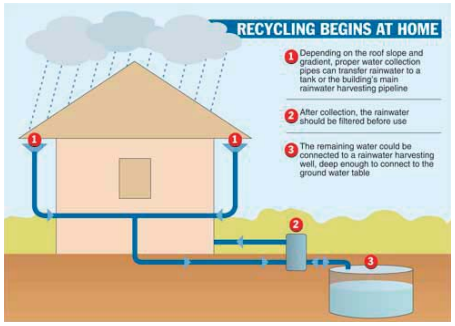
Under Hydrology Project Phase –I , funded by World Bank about 56 Standard Rain gauge, 12 automatic rain gauge, 44 gauge discharge stations, 12 gauge stations and 9 full climatic stations were established. Presently real time data acquisition system (RT-DAS) has been taken up under Phase –II. Under this phase 107 hydro meteorological stations are being installed. The installation may be completed soon.

Increasing the water use efficiency, Bench Marking & Water Audit in irrigation projects. [WATER/KP/4]

State government has proposed to take up lining of the irrigation canals to increase the conveyance efficiency so that the end users gets the benefit. Technical committee has cleared lining of canals of 11 major and medium projects at a total cost of INR



723.46 crore and 12 minor irrigation projects at a total cost of INR 58.08 crore.



Construction of Water Harvesting Structures i.e., Check-dam to adapt to the climate change scenario [WATER/KP/5]

Since the rivers in Odisha are seasonal with lower availability during the non-monsoon period it is essential to conserve the surplus monsoon water for utilization during the dry period. As the storage reservoirs could not be taken up due to various reasons it is proposed to construct check dams and barrages across the rivers to create in-stream storage. Actions have been taken up to invite tender towards construction of two number of barrages. Check dams are being constructed to facilitate the water storage towards facilitate agricultural activity during the dry spell. The number of check-dam projects taken up are as follows:

Year	Number of project completed	Area Retrieved (ha)
2011-12	76	998
2012-13	69	742
2013-14 (Oct 13)	6 (1350 projects were sanctioned for total budget of 348.25 cr)	335

The traditional tanks in the villages were serving as a sound mode of conservation of water. Around 1190 numbers of tanks have been renovated and 400 tanks' renovation are in progress. Similarly under Odisha Community Tank Management Project funded by World Bank, about 324 tanks are being renovated. Planning Commission has given clearances for construction of 10 water resource development projects (Brutang Irr. Project, Samakol, Duhauragotha, Ong Dam, Upper Lanth Dam, Ib Dam, Katra Dam, Banktira Barrage, Sona Barrage and Kusumi Barrage).

Improvement of drainage system [WATER/KP/6]

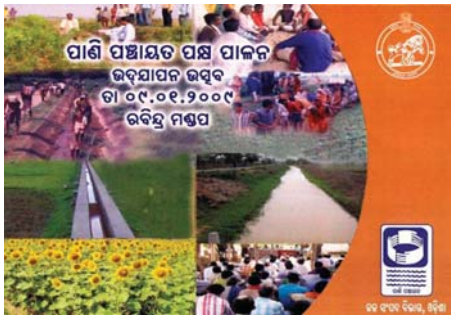
Water logged areas pose serious threat to the social and environmental conditions of the habitats. Drainage organisation has emphasized on retrieval of water logged area and clearance of drainage congestion in the command area of coastal belt of Odisha thereby raising the productivity as well as economic condition of people. Considerable achievement has been made by excavation and renovation of major drainage system with suitable structures. The outfall point of the drainages that fall to the rivers and sea are the most important factors towards de-siltation and removal of silt are carried out on a priority basis. The department of Ocean Engineering, IIT Madras has been entrusted to provide the technical support in completing the de-siltation work. Proposal are being formulated towards cleaning the mouth of rivers for free and safe discharge of accumulated water from the catchment area.

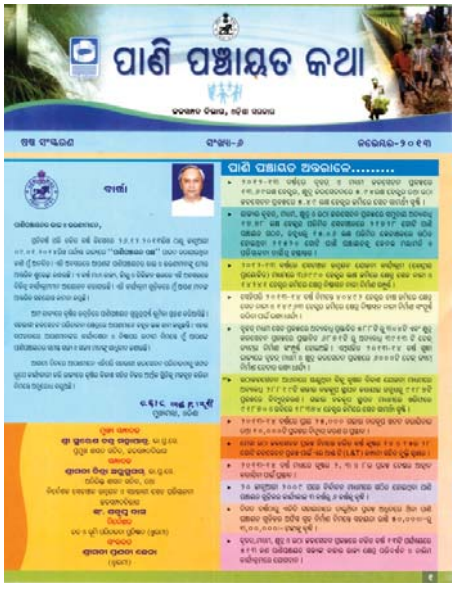
River Health Monitoring, Ecosystem Environmental Flow demand studies [WATER/KP/7]

The State Pollution Control Board is conducting study on regular basis river health monitoring of nine out of eleven river basins in the state. Water quality monitoring of 75 monitoring stations during the year 2012 revealed that out of the four critical parameters such as pH, DO (Dissolved Oxygen), BOD (Biochemical Oxygen Demand), and TC (Total Coliform) parameters like pH and DO at all stations remained within the criteria limit (Class C- drinking water source with conventional treatment followed by the disinfection), whereas BOD and/or TC have exceeded the criteria limits probably due to discharge of untreated domestic waste water to nearby water bodies.

Pani Panchayat Institutionalised

Bio monitoring: Bio monitoring at twenty four selected sites out of seventy five locations indicates that biological water quality class at three location conforms to Class B (slight pollution) eighteen locations to the Class C (Moderate pollution) and one location remains within B&C.





Awareness raising of Pani Panchayats through Farmers' Training Programme& creation of Agro-climatic stations [WATER/KP/8]

Pani Panchyat support unit (PPSU) and CAD-PIM Directorate and WALMI are conducting awareness programmes on the water issues like efficient water management, rain water harvesting, water conservation and water quality. In order to operationalize different concepts/themes with a view to create mass awareness amongst the general public and farming community following IEC activities have been taken up:

1. Election Campaign: Election Campaign has been taken up in all divisions of major, medium, minor and lift irrigation project through mobile van, audio CD & banner to create mass awareness for active participation of Pani Panchayat members.
2. Wall Painting
3. Posters and charts
4. Publication of Pani Panchyat Samachar
5. Monthly Newsletter on Pani Panchyat
6. Advertisement and public message in newspaper and magazines
7. All India Radio
8. Telecasting of video spots through doordarshan/ local channel.
9. Organisation of essay competition on water conservation/water quality

The details of the training imparted by WALMI are outlined below:

Type of Training	Number of Participant		
	2011-12	2012-13	2013-14
Increasing water use efficiency, benchmarking & water auditing in irrigation project	170	95	57
Awareness creation amongst PaniPanchyats through farmers training programmes	1199	2375	372

Integrated Water Resources Management [WATER/KP/9]

A road map for implementation of integrated water resource management (IWRM) has been prepared under ADB assistance. Baitarani Basin has been selected as pilot basin for implementation of IWRM. In the meantime IWRM modeling for the Brahamani–Baitarani basin under AUS-AID programme has been taken up at national level. A joint working group has been formed by MoWR to monitor the progress. Training has been imparted to officials of the state on modelling of the basin.

Budgetary allocation

The budgetary allocation for the sector has been given below for three years.

Figures are in Rs Crore

	2014-15	2013-14	2012-13
Odisha Total Budget	80,139.58	60,303.09	52,030.70
Budget for Water Sector	5087.69	4024.53	3466.42
Climate change related	630.47	605.27	908.27

Type of Project	Budget (in Cr)
Adaptation	630.47
Mitigation	0.00
Both	0.00
Total	**630.47**

Nature of Project	Budget (in Cr)
Capacity Building	1.00
Investment	629.47
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**630.47**

Summary of externally aided projects

The net budget provisions for 2014-15 for various Externally Aided Projects have been presented here. Some projects like sl no 1,2, 3,4, 6, 7, 9,11, 13, 14 have direct linkages with SAPCC priorities. Livelihood projects like OTELP, TRIPTI, Girls Incentive projects enhance adaptive capacity indirectly too. Pipeline projects 1,2,3 too have strong climate change link.

BUDGET PROVISION FOR DIFFERENT EXTERNALLY AIDED PROJECTS UNDER STATE PLAN FOR FY 2014-15

(₹. in Crore)

Sl. No.	Name of the Projects	Donor Agency	Implementing Departments	Project Cost	Project Period	Budget Provision for 2014-15					Remarks
						Total	External Assistance			Local Cost	
						(Col. 10+ 11)	Loan	Grant	Total (Col. 8+9)		
1	2	3	4	5	6	7	8	9	10	11	12
	A. ON GOING PROJECTS										
1	Rengal Irrigation Project Phase - I, Tranche - III	JICA, Japan	Water Resources	884.30	June 2004 to Nov 2015	4.96	0.00	0.00	0.00	4.96	Loan
2	National Hydrology Project, Phase - II	World Bank	Water Resources	22.65	05.04.2006 to 31.05.2014	6.75	6.00	0.00	6.00	0.75	Loan
3	Odisha Tribal Empowerment and Livelihood Programme	IFAD / WFP & DFID	S.T.& S.C. Dev.	325.00	2003-04 to 2013-14 (extended upto Sept2015)	50.00	48.00	0.00	48.00	2.00	Grant (70%) Loan(30%)
4	Odisha Forestry Sector Development Project	JICA, Japan	Forest & Environment	802.30	2006-07 to 2014-15	105.00	100.00	0.00	100.00	5.00	Loan
5	Odisha State Roads project	World Bank	Works	1431.19	2009-10 to 2013-14 (Extended up to June 2016)	189.00	180.00	0.00	180.00	9.00	Loan
6	Odisha Community Tanks Management Project	World Bank	Water Resources	375.00	2008-09 to 2013-14 (extended upto June 2016)	60.00	56.00	0.00	56.00	4.00	Loan
7	Odisha Integrated Irrigated Agriculture and Water Management Investment Project	ADB	Water Resources	1384.10	Jan 2009 to Sept 2017	234.74	223.00	0.00	223.00	11.74	Loan
8	Odisha Health Sector Plan	DFID	H & FW and W & CD	800.00	2007-08 to 2014-15	115.00	0.00	110.00	110.00	5.00	Grant
9	Odisha Integrated Sanitation Improvement Project (Bhubaneswar & Cuttack)	JICA, Japan	H & U.D.	945.13 Revised- (2974.66)	Dec 2009 to Feb 2015	530.00	501.00	0.00	501.00	29.00	Loan
10	Targeted Rural Initiatives for Poverty Termination Infrastructure (TRIPTI) (Odisha Rural Livelihood Project	World Bank	Panchayat Raj	509.00	31.03.2009 to 31.03.2014 (extended upto June 30, 2015)	122.00	113.00	0.00	113.00	9.00	Loan
11	Odisha Urban Infrastructure Development Fund (OUIDF)	KFW, Germany	H & U. D.	50 M Euro 360.00	2012-13 to 2016-17	75.00	70.00	0.00	70.00	5.00	Loan
12	Odisha Modernising Economy Governance & Administration (OMEGA)	DFID	Finance	£ 19 M	2011-12 to 2016-17	26.50	0.00	25.00	25.00	1.50	Grant
13	Dam Rehabilitation Improvement Project (DRIP)	World Bank	Water Resources	347.74	13.04.2012 to 18.04.2018	20.00	18.00	0.00	18.00	2.00	Loan
14	Rengali Irrigation Project, LBC - II, Phase - II	JICA, Japan	Water Resources	1074.04	2012-13 to 2016-17	145.04	134.00	0.00	134.00	11.04	Loan
15	Odisha Girls Insentive Programme	DFID	S.T.& S.C. Dev.	£21M	Jan 2013 to Jul 2016	21.00	0.00	21.00	21.00	0.00	Grant
	A - TOTAL (ON GOING)					1704.99	1449.00	156.00	1605.00	99.99	
	B.PIPE-LINE PROJECT										
1	Odisha Disaster Recovery Project Construction of 30,000 damaged houses	World Bank	R & D. M.	1100.00 ($183M)		400.00	360.00	0.00	360.00	40.00	Loan
2	Odisha Disaster Recovery Project Rehabilitation of Urban Slums in Berhampur	World Bank	H & U. D.	210.00 ($35M)		70.00	67.00	0.00	67.00	3.00	Loan
3	Odisha Power Sector Emergency Assistance Project	ADB	Energy	600.00 ($100M)		250.00	243.00	0.00	243.00	7.00	Loan
4	Odisha Skill Development Project	ADB	ETE&T			0.01				0.01	
	B. TOTAL (PIPE-LINE)					720.01	670.00	0.00	670.00	50.01	
	GRAND TOTAL					2425.00	2119.00	156.00	2275.00	150.00	

Institutional Development and sectoral policy

The state has been contemplating several institutational strengthening initiatives to address adaptation and mitigation action on climate change. Some of these aspects have been summarized below:

Sector	Initiative in ID and Policy	Likely benefit
Agriculture	Crop contingency plan in case of disasters initiated by NICRA; Farmer producer organisations and their institutional development; Odisha Watershed Development Mission	Enhanced adaptive capacity Livelihood, food and nutrition security
Coast and Disaster	Disaster Management Institute is being contemplated, ICZMP has created knowledge hubs, NCRMP for cyclone mitigation, multi-hazard planning	Reduced vulnerability livelihood security
Energy	Green Energy Development Corporation for green generation boost; effort on for solar policy, smart grid plan	Mitigation benefit, quicker grid parity
Fishery and ARD	Five year perspective plan by the department to address issues relating to climate change	Reduced vulnerability, livelihood security
Forest and Environment	Climate Change cell, Biodiversity Board, Wetland Development Authority, CAMPA cell; strengthening of the State Pollution Control Board	Institutional mechanism for enhanced adaptation and mitigation
Health and Family Welfare	NRHM, Urban health mission, integrated disease surveillance program,	Enhanced adaptation
Housing and Urban Dev.	Modification of Building codes for energy efficiency, solar city programme, City Development Plan, Odisha Urban Water policy.	Enhanced mitigation
Industry	Low carbon growth strategy and fiscal instruments, carbon foot printing with industry association (CII)	Tracking mitigation

Sector	Initiative in ID and Policy	Likely benefit
Steel and Mines	Working with SPCB on a disclosure programme on climate change adaptation and mitigation initiatives, baseline estimate in vulnerable pockets (air, water, waste) to take corrective actions, PAT scheme in association with BEE.	Tracking mitigation
Transport	State transport policy, inland water management policy, Minor port development policy	Reduced congestion, improving alternate transport, modal shift
Water Resources	Integrated water resource management policy and state water policy linking the climate change related issues	Enhanced adaptation

Conclusion

The above report is highlighting the following:

1. The climate change cell is functional and able to get reasonable standardized output in a format (developed and given in the annexure)
2. The nodal officers (most of them) are able to track the allocation as per the priority areas in the SAPCC.
3. It is clear from the analysis that there has been a significant increase in climate related allocations since the formulation of SAPCC (about 2012).
4. Some departments where such allocation are not captured, activities are taken in association with other departments (mining with forest; transport with urban development)
5. The expenditure and outcome figures are yet to come by, but output figures have been reported.
6. The climate related allocations may be more than what is presented here. Once a full review is done with adequate time the figures will be more transparent from the budget. Some information are still being compiled by departments.
7. The process will be stabilized after a few cycles of training and reporting.
8. In this template easily the categorization can be made and linkages can be established.
9. New priorities may even come while developing the departmental annual plan and budget.
10. There has to be a separate analytical work to assess adaptive capacity in each sector based on the allocations made. Three years figure presented here is a short span.
11. Possibly targets based on the national missions, can be assigned to some of the sectors and their adaptation and mitigation benefits be monitored.
12. Capacity building on climate change issues can be mainstreamed in association with administrative training institute of the state i.e. Gopabandhu Academy of Administration, State Institute of Rural Development, IMAGE, etc.
13. It will be useful to enhance the capacity of the Climate Change cell as the knowledge hub on climate change related issues and provide support to departments on a regular basis.

Annexure A

SAPCC Missions and Review Process

Chief Secretary has been reviewing the climate change implementation periodically. The summary of the minutes of the recent meetings have been given below.

The 3rd meeting on climate change action plan implementation was held on 15 March 2013.

Key decisions taken in this meeting are as follows:

Chief Secretary who chaired the meeting set three broad objectives for all departments (a) Reduction in energy consumption (b) Reducing pollution/emission (c) Mitigating the pollution overload. Each department has to come up with 4/5 priority activities around these objectives if possible with an Annual action plan/5 year perspective plan by each department. Some of the priority activities already identified in SAPCC can be taken up under existing schemes without waiting for funding.

Agriculture

Climate change related research; reduction in chemical fertilizer, adoption in SRI methods and water use efficiency.

Energy

Green Energy Development Corporation to be set up by Energy Department; T&D loss reduction budget of INR 8000 crore; INR 5000 crore to be available under existing schemes and INR 3000 crore additional fund required. Energy conservation measures: ECBC mandatory for plinth areas above 1000 sq. ft. RPO to be enhanced from existing level of 0.5% to give fillip to solar energy in particular. Use of LED in departments and ULBs and promotion of energy audit.

Fishery and ARD

Conservation of indigenous livestock varieties, fodder cultivation, gobar gas promotion.

Forest

Aggressive plantation target; fodder conservation for wildlife, checking forest fire and use of technology to reduce extinction of species.

Health

Soak pits and hand-pumps through Gaon Kalyan Samiti to promote water and sanitation; drainage clearance; Gambucea fish culture to control certain vectors.

Housing and Urban Development Department

Energy efficient pump sets for PHED, LED uses.

Transport

Inland water transport from Anugul to Dhamara to reduce dirty cargo movement by road.

Water Resource Department

Creation of large water bodies (> 200 acre) in high pollution areas of Jhasuguda, Talcher, Anugul with mechanized excavation. Expansion of hydrometry, flood forecasting related research and carrying capacity study of rivers.

The 4th meeting of Monitoring and Advisory Committee of Climate Change Action Plan has been held on 11 December 2013.

The key decisions taken in this meeting are as follows:

Monitorable target for each activity to be fixed by each implementing agency/department. Each department must have a nodal officer for coordination.

Agriculture

To promote SRI method of paddy cultivation, line-sowing target to be enhanced to 1 lakh ha/ annum; integrated pest management to be promoted.

Energy

Comprehensive sub-plan for energy sector i.e. baseline data for thermal power plant, plant specific retrofit work as per pollution norms; development of state plan scheme for rooftop solar power generation. Biogas target to be enhanced to 15000 units/year and household level interventions like improved cook stove, solar, bio-gas etc. to be encouraged. OMFED is to be roped in for bio-gas related work. Energy conservation budget provision to be enhanced from INR 20 crore to INR 50 Crore and LED street lighting to be promoted in Urban Local Bodies.

Forestry

Extensive plantation and nursery activities, 20,000 sq. km. forest need to be converted to dense forest.

Housing and Urban Development

Energy efficient pump-sets in PHED; LED lighting in ULBs and if possible use of solar pumps.

Mining

To bring in policy to discourage the transportation of minerals by road to air pollution.

Water Resource Department

To promote rainwater harvesting and promotion of check dams for water conservation; use of solar pumps to reduce energy use.

Annexure B

Summary budget matrix

	Odisha Budget	Unit	2014-15	2013-14	2012-13
	Total Budget	in Crore	80,139.58	60,303.09	52,030.70
1	Agriculture		2,727.99	1,823.77	1,519.31
	Climate Change Related		556.28	631.44	218.46
2	Coast and Disaster		2660.94	1337.62	1191.44
	Climate Change Related		319.46	208.00	36.15
3	Energy		1283.03	743.681	542.26
	add renewable energy		28.80	13.97	12.27
	Energy Total		1311.83	757.65	554.53
	Climate Change Related		509.40	367.48	274.33
4	Fishery and ARD		825.85	447.09	402.25
	Climate Change Related		28.33	27.69	15.41
5	Forest and Environment		716.01	665.19	589.98
	Climate Change Related		554.59	310.05	246.39
6	Health and Family Welfare		3,897.74	2192.18	1811.91
	Climate Change Related		36.10	30.03	0.00
7	Housing and Urban Dev.		3031.65	2385.46	1575.99
	Climate Change Related		502.12	0	0
8	Industry		17.44	27.48	8.7
	add MSME		95.84	70.26	59.92
	Industry		113.28	97.74	68.62
	Climate Change Related		70.5	0.175	0
9	Steel and Mines		78.69	65.08	38.08
	Climate Change Related		0	0	0
10	Transport		251.56	157.83	52.92
	Climate Change Related		0	4.22	1.16
11	Water Resources		5087.69	4024.53	3466.42
	Climate Change Related		630.47	605.27	908.27
TOTAL	Climate Change Related		3207.26	2184.35	1700.17
	% of total budget (plan+non-plan)		4.0%	3.6%	3.3%

PROGRESS MONITORING SHEET - 2014-15

AGRICULTURE

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
AG/KP/2	Establishing Institutional delivery mechanism to promote best practices on climate change adaptation	Training programme for farmers under RKVY (1000 nos)	100.00	0.50
		Training programme for farmers under State Employment Mission (2000 nos)		1.78
		Training programme for farmers under ATMA / State Plan (5000 nos)		0.25
		Training programme for farmers under National Horticulture Mission (3900 nos)		0.20
AG/KP/3	Capacity building of extension personnel or farmers	650 Programmes	54.00	0.83
AG/KP/5	Increasing the area under perennial fruit plantation to help cope with uncertain weather patterns	Perennial plantations under MGNREGS (20000 ha)	50.00	501.67
		Perennial plantations under NHM/State Plan/ DCCD (4200 ha)		5.04
AG/KP/6	Developing water efficient micro irrigation methods and individual/ community farm ponds	Popularisation of sprinkler sets (1900 nos)	12.00	1.46
		Popularisation of sprinler main guns (100 sets)		0.15
		Pipes for the 1900 sprinkler sets		2.85
AG/KP/7	Improving monitoring and surveillance technique in the context of climate change	in 30 districts	24.00	2.06
AG/KP/8	Developing sustainable soil, water and crop management practices	Reduction in use of chemical fertiliser (bio-fertiliser in 51000 ha) and promotion of organic farming (5500 ha)	2.50	4.31
AG/KP/10 (a)	Preparedness to tackle emerging scenarios of pests	IPM Promotion (156 trainings) and demo. In 12000 ha	2.00	0.31

AG/KP/10 (b)	Increased seed [production of rice seeds] to meet req. under various scenarios	Promotion of SRI (11000 ha) and cluster demonstration (4000 ha)	2.00	8.52
		Line sowing/line transplanting improved methods (150510 ha)		26.36
		TOTAL	**246.50**	**556.29**

Adaptation	36.60
Mitigation	519.69
Both	0.00
Total	**556.29**

Capacity Building	3.56
Investment	506.71
Pilot/Demo	19.66
Policy Action	0.00
Pre-Investment	0.00
Research Study	26.36
Total	**556.29**

COAST AND DRM

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
CD/KP/5	Construction of flood shelters in unconventionally vulnerable locations (i.e. traditionally dry areas facing flodding and water logging due to climate change) and strengthening the community to face the changing patterns of adaptation	Construction of multi-purpose flood shelters	100.00	169.50
CD/KP/6	Need assessment and construction of multipurpose cyclone shelters in the cyclone prone areas of the state along with provision of emergency equipment to the Cyclone shelters and strengthening the capacity of the local people for disaster management.	Construction of multi-purpose cyclone shelters	400.00	115.25
CD/KP/12	Setting up an integrated training and capacity building protocol for raising the level of awareness of the community and major stakeholders with respect to the mitigation and adaptation mechanism arising due to effects of climate change on agriculture and livelihood support system and disaster preparedness	Setting up of an Integrated Training and Capacity Building Institute for Disaster Management	100.00	30.00
CD/KP/16	Study of impact of global warming on the bio-diversity of the coastal ecosytem with special emphasis on the flagship species	Under ICZM project component funded by the World Bank	**5.00**	**4.71**
		TOTAL	**605.00**	**319.46**

Adaptation	319.46
Mitigation	0.00
Both	0.00
Total	**319.46**

Capacity Building	30.00
Investment	284.75
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	4.71
Total	**319.46**

ENERGY

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
ENERGY/ KP/2	Institutional development (Capacity building/restructuring) of Energy Department for implementing policies and conducting studies consisting of following activities. 1. Functional Reorganization And Capacity Building of The Energy Department, OERC & OREDA To Have A Coherent Road Map to achieve efficient functioning and implementation of energy efficiency, energy conservation, promotionofrenewable energy. 2. Integrated Super critical (660 MW) IPP Policy (Coal Washeries, Fly Ash based cement and brick plants) Minimum unit size for the purpose of IPP/MPP should not be less than 300 MW to achieve minimum standards of efficiency. 3. Revised RPO based on the Changing Load mix and Assessment of Evacuation Infrastructure	GEDCOL has been formed with main objective of 1. To promote investment to renewable energy projects & various green energy sources & to develop & execute special renewable energy project in commercial and / or demonstration basis. 2. To plan, organise, implement maintains and operate renewable energy projects to generate & sell electric power only. EIC(Electricity)-cum-PCEI Office has been re-organized 1. As administrative head of Electrical inspectorate and project wings of Energy Dept. Chief Electrical Inspector, T&D and Chief Engineer(Projects)-Cum-Chief Electrical Inspection (Gen) are under the administrative control of E.I.C. (Electricity). The total strength of Electrical Engineers under the administrative control of E.I.C. (Electricity) is as follows: EIC(Electricity)-cum-PCEI : 01 Chief Engineers : 06 Superintending Engineers : 09 (L-I) Superintending Engineers : 06 (L-II) Executive Engineers : 49 Deputy Executive Engineers : 17 Asst. Executive Engineers : 127 Asst. Engineers : 61	40.00	5.83

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
	4. To conduct a study for determination of State Emission intensity Develop an operational plan for the Fund that will get revenue for the sale of power that is exported. 5. Feasibility study of establishment of coal based thermal power plants along coast of Orissa, use of saline water and dedicated rail corridor for coal transportation to be conducted. Ø Feasibility of Implementation of emerging Clean Coal Technologies through pilot projects in Orissa Training of the Members of working group or their representatives of different departments and organisations on sector specific climate change issues.	Ø E.I.C. (Elec.) –Cum-PCEI has the responsibilities to plan and develop the safety procedures, manage safety of electrical installations of the state and collection of revenue on electricity duty, electrical inspection, monitoring and implementation of Small Hydro Projects, Rural Electrification etc. It has also been declared as State Designated Agency (SDA) by the State Government to coordinate, Regulate and Enforce Provision of Energy Conservation Act, 2001 in the State. Ø In order to improve the Electricity supply condition and to reduce the Technical & Commercial loss in Power Sector and to punish the people as per the prevailing law involved in the electricity theft, the State Govt have till date established 34 Electricity Police Station.		

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
ENERGY/ KP/3	Reduction of T & D losses: Develop an operational plan for a targeted reduction of losses due to pilferage and outdated systems (estimated to be about 40%). The activity includes augmentation of T & D infrastructure and investment plan, enhancing present practices for improved load management & feasibility study of evacuation corridors	CAPEX – was launched to improve T&D infrastructure of the State to enhance quality and reliability power supply to the consumer with objective to reduce the losses. ODSSP – envisaged construction of 520 nos. of new 33/11kv sub-stations along with associated networks to addressed low voltage problem as well as loss reduction in rural area. DISASTER RESILIENT POWER SYSTEM- To convert all 33 KV and 11 KV lines in 50 KM radius of the costal line with NBLS towers and H-poles to withstand high wind speed over 300 KM/hr and also to make them disaster resilient. State Capital Region Improvement of Power Supply (SCRIPS)- Due to tremendous infrastructure growth in and around Bhubaneswar city there is immediate need of need to expand and strengthen the existing power infrastructure to provide 24X7 un-interrupted power supply. Redial to ring conversion project - is conceptualized both in distribution and transmission system at 220 KV, 132 KV, 33 KV and 11 KV lines to provide un-interrupted power supply in case of any disturbance due to either sub-station or line failure throughout the State. Smart Grid- To keep a pace of modernization, growth of consumer network and to provide quality power supply the SMART Grid automation adoption in Distribution and Transmission utility is immensely needed.	5,500.00	460.02

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
ENERGY/ KP/4	DSM/EE: Develop a comprehensive policy and plan to save energy use in order to reduce the demand – supply gap and contribute towards climate change abatement including the following measures: - Implementation of utility level DSM measures – Policy action -Awareness Generation for Energy Conservation - Promotion and implementation of the National BEE's ECBC code for widespread adoption in the state to reduce the energy consumption in buildings. For proper energy monitoring, capacity building of energy auditors, strengthening of existing energy conservation Cell supported with manpower and infrastructure.	Energy Conservation implementation works for 2014-15 > In order to implement Energy Conservation Act, 2001 in its real term Odisha Energy Conservation Building Code (ECBC) framed for execution in the State. Odisha State Energy Conservation Fund Rule has been framed for promoting energy conservation in the State. > A State level scheme for promoting energy efficiency in the government sector in participatory mode has been framed. > As a part of energy conservation action plan, Investment Grade Energy Audit (IGEA) of 20 government buildings including Odisha Legislative Assembly, State Secretariat, Raj Bhawan, Jayadev Bhawan, Capital Hospital etc. have been completed. > This study with more than 14 MVA contract demand and more than 11 MW of connected load has explored and energy saving potential of more than 2 MW. > Besides, energy audit has been completed in OMFED Diary Plant and thereby an energy saving of 25% has been explored by the study. Four major pumping stations, Mundali, Berhampur, Bolangir and Bhubaneswar have been identified and DPRs are being prepared for implementation of the measures.	460.00	15.00

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
		> 100 new buildings have been finalized for taking energy audit including district Collectorate and district Headquarter Hospital in the State. LED village (Light Emitting Diodes) campaign launched by Bureau of Energy Efficiency (BEE) and Government of India 2 villages viz; Raghurajpur (Craft village) and Satyabhamapur (birth place of Utkal Gourav Madhusudan Das) have been taken as a part of nationwide LED village campaign. OPGC has taken following steps for Energy Conservation: > Adoption of energy conservation measures & energy efficient technology has been already planned & included in township expansion & renovation plant to be carried out during 2014-15. > 5* rating AC machine is being procured. T-5, CFL lightings are procured for street lighting. 15 numbers of LED street lights have been fitted. In the coming financial year, it is planned to fix 200 more LED street lights.		
ENERGY/ KP/6	Promotion of Small and Medium Hydel plants	For Promoting SHEP, OHPC has taken up following steps – 1.Pre-feasibility report on Jurakhamon-2.5 MW, Khilamunda-1.2 MW, Mushal-4 MW, Chheligarh-5.2 MW projects has been prepared. ii. Work order for preparation of prefeasibility report on Kharag,I, II, III, IV of 18 MW each have already been issued. iii. Negotiation is going on with Rourkela Steel Plant (SAIL) for setting up of a SHEP at Mandira Dam.	41.00	0.01

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
ENERGY/ KP/7	Maximize harnessing biomass potential in the state through cogeneration/ thermal/ power plant/ gasification to feed the grid as green power. Increase in application of CPP both in grid and stand alone mode	Catchment wise Biomass Resource Assessment	50.00	0
ENERGY/ KP/9	Maximize solar power generation in the state in both PV and thermal routes and increase the penetration of standalone solar systems for use by institutions, communities and individuals	1. To promote the generation of Solar Power & power from SHEP, GEDCOL has been formed. And Financial Advisory Serving Agreement has been signed with IFC for setting up of roof top Solar plants at twin city of Bhubaneswar –Cuttack. On the first phase, it is proposed to install solar photovoltaic panels utilizing non-residential Govt. building only. According, survey & investigation work is going on both the cities. OPGC has taken following steps: 2. Provision of solar water heating system in guest house & canteen is going to be executed in 2014. 3. As regard the installation of solar PV panel for plant service building & resource centre lighting load, the feasibility has been studied and the proposal has been dropped due to not cost effective. 4. Grant assistance to GEDCOL for solar and micro-hydel	100.00	10.00
		Provision of Solar PV based dual pumps for supply piped drinking water in remote rural areas in non-IAP districts		5.03
		Provision of solar lanterns and study lamps to all households using kerosene to meet their minimum illumination needs		3.50

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
		Provision of rooftop Solar power plants in government buildings		0.01
		Provision of Solar Water Heating Systems in BMC area		0.00
		Solar Energy for Enhancing Tourism Potential		0.00
		Application of solar water pumping for aerobic paddy cultivation		0.00
ENERGY/ KP/10	Development of Biogas and manure management including examining the bio fuel policy in the state and linkage with blending infrastructure	Installation of domestic biogas plants under NBMMP	4.00	0.00
NON CCAP action	Provision of Improved Cook-stoves to Schools and Anganwadi Centres			10.00
		TOTAL	**6,195.00**	**509.40**

Adaptation	
Mitigation	509.40
Both	
Total	**509.40**

Capacity Building	5.83
Investment	503.56
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.01
Research Study	0.00
Total	**509.40**

FISHERY & ARD

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
FARD/KP/7	Disease Early Warning System	Development of Early Warning System of Livestock Diseases with relation to Climate Change in Odisha	2.00	0.22
FARD/KP/8	Impact of climate change on animal husbandryapplication of biotechnology and skilled animal breeding for developmentofbetter adopted species	Application of Biotechnology and Skilled Animal Breeding for development of better adapted livestock breeds in Odisha	2.00	6.24
FARD/KP/9	Capacity building of livestock keepers	Capacity Building Programme on Climate Change	2.50	2.46
FARD/KP/10	Impact of climate change on inland and coastal aquaculture	Alternative livelihood due to ban & Shifting of Fishing Ground (scale of activity- Coastal areas of the state)	3.00	16.00
		Research Study on climate change & its impact on Fisheries (Inland & Marine) [scale of activity- State Wide]		0.40
FARD/KP/11	Development of infrastructure for early warning systems in coastal areas for fisheries	Awareness among stake holders on climate change (scale of activity- Coastal areas of the state)	5.00	0.008
		Set up of early warning System infrastructures for Natural Calamities (scale of activity- Coastal areas of the state)		3.00
		TOTAL	**14.50**	**28.33**

Adaptation	28.33
Mitigation	0.00
Both	0.00
Total	**28.33**

Capacity Building	2.46
Investment	3.01
Pilot/Demo	0.00
Policy Action	6.24
Pre-Investment	0.00
Research Study	16.62
Total	**28.33**

FORESTRY

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
FOR/KP/1	Increasing reforestation/ afforestation activities in degraded forest areas	(i)AR:39,122ha, (ii)ANR: 1,10,746ha - Total: 1,49,868 ha.	2400.00	153.93
FOR/KP/2	Protecting existing forest stocks to act as carbon sink with stronger conservation	48,90,000Sq KM	500.00	20.71
FOR/KP/3	Increasing planting on non forest land and also exploring where new and increased tree planting could create barriers to storm and cyclone impacts in coastal zones.	Distribution of Seedlings to the Beneficiary/farmers to be planted in the land outside forest areas: 5.5 Crores Seedlings Coastal Shelter Belt Plantations: 2,200 ha.	50.00	47.25
FOR/KP/4	Covering bald hills with suitable species mix	1000 ha	20.00	11.70
FOR/KP/5	Increasing and protecting existing mangrove cover along the coast	Mangrove Plantation for 300 ha	100.00	20.00
FOR/KP/6	Assessing fire management strategies	Entire Forest Areas	100.00	20.00
FOR/KP/7	Improving tree planting and forest management to integrate with watersheds and water resources management	Drainage line treatment, Check dams, percolation tanks, planting pits, etc	1200.00	240.00
FOR/KP/8	Working to establish new systems to support for community users	LLI initiatives under OFSDP project to the VSS members in order to reduce pressure on Forests - Entire Project Areas	50.00	15.00
FOR/KP/9	Undertaking studies on indigenous tree species to assess their vulnerability to climate change	Research studies to address the issues of adaptation concerning tree genotypes particularly indigenous species	10.00	2.00
FOR/KP/10	Assessing additional threats to biodiversity and wildlife	Continuous monitoring of the ecosystems to determine when & what changes occurs	100.00	20.00

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
FOR/KP/11	Obtaining access to updated knowledge on climate change science and policy development	To sensitize the front line managers, policy makers & essentially staff at all levels of the forest department.	10.00	2.00
FOR/KP/12	Capacity building of JFM & CFM Committees and Panchayati Raj Institutions to adapt to climate change	A series of trainings & awareness generation programmes will be undertaken. Wherever voluntary initiatives to protect forests exist those would be recognized & strengthened	5.00	1.00
FOR/KP/13	Monitoring carbon stock and biodiversity at regular intervals	Developing a new & independent org. a forest monitoring agency under the Forest department will be undertaken	5.00	1.00
		TOTAL	**4550.00**	**554.59**

Adaptation	60.00
Mitigation	254.59
Both	240.00
Total	**554.59**

Capacity Building	3.00
Investment	528.59
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	20.00
Research Study	3.00
Total	**554.59**

HEALTH

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Crore
HEALTH/ KP/3	Strengthening approaches to manage Vector Borne Disease that have worsened due to climate change impacts	Construction of hatchery for biological control of mosquito	75.00	1.50
		Mechanism for monitoring of activities under Integrated Vector Management (IVM) by MPHS (Multipurpose Health Supervisors)		1.39
		Construction of soak-pits for insecticide disposal		0.21
HEALTH/ KP/4	Strengthening approaches to deal with Heat Wave Conditions exacerbated due to climate change	Strengthening approaches to deal with Heat Wave Conditions exacerbated due to climate change (Justification, Scope of Activity and further expansion)	165.00	30.00
HEALTH/ KP/7	Undertaking measures to manage Water Borne Disease that have worsened due to climate change impacts	Undertaking measures to manage Water Borne Disease that have worsened due to climate change impacts	30.00	3.00
		TOTAL	**270.00**	**36.10**

Adaptation	36.10
Mitigation	0.00
Both	0.00
Total	36.10

Capacity Building	30.00
Investment	3.10
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	3.00
Total	**36.10**

HOUSING AND URBAN DEVELOPMENT

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) in Rs Crore
HUD/KP/1	To orient and sensitize the stakeholders at all levels of ULBs towards issues related to climate change and capacitate them for carrying out the planning and execution of different activities under comprehensive capacity building programme.	Conduct the training programmes covering the aspects on challenges and combating the issues in climate change and their respective roles and responsibilities.	20	2.71
		Conduct an exposure visit of the officials to the cities where projects to combat the climate change challenges were implemented		1.14
		Preparation & distribution of IEC materials including environment building activities on adaption measures to climate change.		0.50
HUD/KP/3	"To sensitise city dwellers on non-revenue water loss and orient them towards water conservation measures. To introduce water metering system and ensure Water assessment and audit"	Planning, execution & commissioning of energy efficient measures.	5	3.00
		Water Audit and Bulk metering system		2.00
		Commissioning of computerization & e-Governance initiatives in water supply system		4.00
		Implementation of Capacity Development activities and DPR preparation for ensuring safe drinking water to the citizens.		3.00

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) in Rs Crore
HUD/KP/4	To develop and implement an ideal MSW management plan in a selected city and prepare such plans for state wide implementation	Implementation of the MSW management projects in Bhubaneswar, Berhampur, Sambalpur, Paradeep and Puri cities.	300	151.54
		To plan and implement Solid Waste Management Projects in Balugaon, Bhadrak, Jagatsinghpur, Gopalpur and Konark under ICZMP		19.12
HUD/KP/5	To orient the city dwellers on energy effi cient street lighting and piloting the same through a CDM proposal.	Implementation of energy efficient street lighting projects on PPP mode in Bhubaneswar city.	20	0.60
		Implementing the PPP projects in Cuttack, Berhampur, Rourkela and Sambalpur cities in Phase-1		9.00
		Conducting the impact assessment and approach towards CDM.		0.30
HUD/KP/6	To strengthen the existing guidelines for preparation of Master Plan/CDP by incorporating measures to combat climate change and prepare & implement such a Master Plan/CDP for a selected city. The activity will be outsourced through a technical organization.	Study and revise GIS/ RS based Master Plan of all ULBs in compliance to adaptive measures of climate change	50	3.00
		Preparation of City Development Plans (CDPs) for 15 selected ULBs to identify projects to combat the issues of climate change through multiple stakeholder consultations.		1.20
		Conduct training sessions& exposure visits for officials involved in preparing Master Plans to get sensitized in different phases.		0.70

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) in Rs Crore
HUD/KP/7	To improve urban infrastructure by making non motorized transport feasible throughout the city. The activity will involve survey of the transport network of the city and development of a plan for improvement along with policy level decisions for incentivising.	Undertake preparation of Detail Project Report (DPR) for Mass Rapid Transit System between Bhubaneswar and Cuttack	500	2.50
		Implementation of the Bus Rapid Transit system (BRTS) in Bhubaneswar city in the selected routes on pilot basis		90.00
		Introduction of City Bus Services in Berhampur-Gopalapur-Chhatrapur-Hinjlicut and Samabalpur-Hirakud-Burla-Jharsuguda clusters		9.00
		Introduction of City Bus Services in Cuttack – Choudwar , Jeypore – Koraput – Sunabeda and Balasore – Bhadrak clusters		59.42
HUD/KP/9	Developing models of urban storm water flows and capacities of existing drainage systems in selected city with climate change	Implementation of the Drainage system improvement projects in Balasore, Bhadrak, Kendrapara, and Konark cities /towns of Odisha under ICZMP	100	101.88
		Implementation of the Storm Water Drainage system project in Jajpur Town.		37.51
		TOTAL	**995.00**	**502.12**

Adaptation	160.64
Mitigation	341.48
Both	0.00
Total	**502.12**

Capacity Building	4.35
Investment	319.95
Pilot/Demo	0.00
Policy Action	12.00
Pre-Investment	165.82
Research Study	0.00
Total	**502.12**

INDUSTRY

KP Code As Per SAPCC	Title of Project	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15)in Rs Crore
IND/KP/ 1	Integrate climate concerns in policies and plans for industrial development and related areas	30	6
IND/KP/ 2	Prepare GHG profile of major industrial cluster	10	2
IND/KP/ 3	Heat-island study for Talcher and Jharsuguda area	10	2
IND/KP/ 4	Training various stakeholders on climate change issues	62	12.5
IND/KP/ 5	Implement a system of compensatory water harvesting	100	20
IND/KP/ 6	Streamline institutional arrangement and strengthen OSDMA to tackle extreme climate events in coastal area	110	22
IND/KP/ 7	Carry out energy efficiency study for iron & steel, thermal power, cement and aluminium sector	10	2
IND/KP/ 8	Promote use of bulk waste material like flyash, dolo char, slag etc.	10	2
IND/KP/ 9	Setting emission targets for thermal power plants	10	2
	TOTAL	**352**	**70.5**

Adaptation	56.5
Mitigation	14.00
Both	0.00
Total	**70.5**

Capacity Building	34.5
Investment	0.00
Pilot/Demo	0.00
Policy Action	30.00
Pre-Investment	4.00
Research Study	2.00
Total	**70.5**

WATER

KP Code As Per SAPCC	Title of Project	Sub project if any	Budget for the project (for entire period) in Rs Crore	Budget provison (2014-15) Rs Crore
WATER/KP/1	Expansion of Hydrometry network	River discharge observation stations, along with automatic rain gauge with Automatic transmission system (No of observation stations-107 {AWS-23,WLS-20,ARG-64})	15.00	6.75
WATER/KP/4	Increasing the water use efficiency in irrigation projects. Water audit, Benchmarking, monitoring & pricing (pilot study)	Increasing the water use efficiency in irrigation projects through Comand Area Development(CADA) (45000 Ha)	20.00	123.84
		Additional Activities, lining of canals in Major & Medium irrigation Projects (Under CLSRP) - 11Nos.		50.00
		Lining of Canals in Minor irrigation Projects (Under CLSRP) (34 nos)		40.00
WATER/KP/5	Constructing and protecting water harvesting structures	For enhancement of in-stream storage through construction of check dams(6000 nos)	470.00	162.00
		Additional Activities, Creation of additional .storage through renovations of tanks under minor irrigation (under RRR schemes) (797 nos)		100.00
		Renovation of MI tanks under Odisha Community Tank Management Projects (OCTMP) (324 nos)		60.00
WATER/KP/6	Improvement of drainage system	To mitigate drainage congestion, reclamation of cultivable land & reuse of drainage water for irrigation	200.00	86.88

WATER/KP/8	Raising awareness with Pani Panchayat through farmers' training programme	Implementing IWRM concept in the basin through participatory management. Conservation of water resources through optimal use of water. Engagement of NGO's for raising awareness (80/4000- nos/ persons)	5.00	1.00
		TOTAL	**710.00**	**630.47**

Adaptation	630.47
Mitigation	0.00
Both	0.00
Total	**630.47**

Capacity Building	1.00
Investment	629.47
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**630.47**

PROGRESS MONITORING SHEET - 2013-14

AGRICULTURE

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Crore
AG/KP/2	Establishing Institutional delivery mechanism to promote best practices on climate change adoption	Training programme for farmers under RKVY (2000 nos)	100.00	1.00
		Training programme for farmers under State Employment Mission (2000 nos): 315 achieved form previous fund		1.78
		Training programme for farmers under ATMA/State Plan (5000 nos)		
		Training programme for farmers under National Horticulture Mission (3900 nos): 250 achieved		0.20
AG/KP/3b	Capacity building of extension personnel and farmers	740 programmes conducted	54.00	0.59
AG/KP/4	Livelihood focussed people centric integrated watershed development programmes in rainfed areas vulnerable to climate variation	1.66 lakh ha	1000.00	200.00
AG/KP/5	Increasing the area under perennial fruit plantation to help cope with uncertain weather patterns	Perennial plantations under MGNREGS (21600 ha)	50.00	368.00
		Perennial plantations under NHM/State Plan/DCCD (4200 ha)		5.00
AG/KP/6	Developing water efficient micro irrigation methods and individual/ community farm ponds	Development of micro irrigation under NMMI (11660 ha)	12.00	29.29
		Individual/community farm pond (1928 nos)		11.71
		Popularisation of sprinker sets (1280)		0.96
		Popularisation of rain guns (100)		0.15
		Pipes for 1680 sets		2.52

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Crore
AG/KP/7	Improving monitoring and surveillance technique in the context of climate change	in 30 districts	24.00	1.89
AG/KP/8	Developing soil, water and crop management practices	Reducing use of chemical fertilisers (use of bi-fertilisers in 35,000 ha)	2.50	0.35
AG/ KP/10b	Increased production of rice seeds to meet requirement under weather scenarios	SRI rice promotion (10, 000 haandclusterdemonstration in 4000 ha)	2.00	8.00
		TOTAL	**1244.50**	**631.44**

Adaptation	5.81
Mitigation	425.63
Both	200.00
Total	**631.44**

Capacity Building	3.57
Investment	617.63
Pilot/Demo	8.35
Policy Action	0.00
Pre-Investment	0.00
Research Study	1.89
Total	**631.44**

COAST AND DRM

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs Crore
CD/KP/5	Construction of flood shelters in unconventionally vulnerable locations (i.e. traditionally dry areas facing flooding and water logging due to climate change) and strengthening the community to face the changing patterns of adaptation	Construction of multi-purpose flood shelters	100.00	120.00
CD/KP/6	Need assessment and construction of multipurpose cyclone shelters in the cyclone prone areas of the state along with provision of emergency equipment to the Cyclone shelters and strengthening the capacity of the local people for disaster management.	Construction of multi-purpose cyclone shelters	400.00	83.00
CD/KP/12	Setting up an integrated training and capacity building protocol for raising the level of awareness of the community and major stakeholders with respect to the mitigation and adaptation mechanism arising due to effects of climate change on agriculture and livelihood support system and disaster preparedness	Setting up of an Integrated Training and Capacity Building Institute for Disaster Management	100.00	5.00
		TOTAL	**600.00**	**208.00**

Adaptation	208.00
Mitigation	0.00
Both	0.00
Total	**208.00**

Capacity Building	5.00
Investment	203.00
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**208.00**

ENERGY

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR	Budget provison (2013-14) if lastyear - Crore
ENERGY/ KP/2	Institutional develo-pment (Capacity building/ restructuring) of Energy Department for implementing policies and conducting studies consisting of following activities. 1. Functional Reorganization And Capacity Building of The Energy Department, OERC & OREDA To Have A Coherent Road Map to achieve efficient functioning and implementation of energy efficiency, energy conservation, promotion of renewable energy. 2. Integrated Super critical (660 MW) IPP Policy (Coal Washeries, Fly Ash based cement and brick plants) Minimum unit size for the purpose of IPP/MPP should not be less than 300 MW to achieve minimum standards of efficiency.	GEDCOL has been formed with main objective of 1. To promote investment to renewable energy projects & various green energy sources & to develop & execute special renewable energy project in commercial and / or demonstration basis. 2. To plan, organise, implement maintains and operate renewable energy projects to generate & sell electric power only. EIC(Electricity)-cum-PCEI Office has been re-organized 1. As administrative head of Electrical inspectorate and project wings of Energy Dept. Chief Electrical Inspector, T&D and Chief Engineer(Projects)-Cum-Chief Electrical Inspection (Gen) are under the administrative control of E.I.C. (Electricity). The total strength of Electrical Engineers under the administrative control of E.I.C. (Electricity) is as follows: EIC(Electricity)-cum-PCEI : 01 Chief Engineers : 06 Superintending Engineers : 09 (L-I) Superintending Engineers : 06 (L-II) Executive Engineers : 49 Deputy Executive Engineers : 17 Asst. Executive Engineers : 127 Asst. Engineers : 61	40	

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR	Budget provison (2013-14) if lastyear - Crore
	3. Revised RPO based on the Changing Load mix and Assessment of Evacuation Infrastructure 4. To conduct a study for determination of State Emission intensityDevelop an operational plan for the Fund that will get revenue for the sale of power that is exported. 5. Feasibility study of establishment of coal based thermal power plants along coast of Orissa, use of saline water and dedicated rail corridor for coal transportation to be conducted. Feasibility of Implementation of emerging Clean Coal Technologies through pilot projects in Orissa Training of the Members of working group or their representatives of different departments and organisations on sector specific climate change issues.	• E.I.C. (Elec.) –Cum-PCEI has the responsibilities to plan and develop the safety procedures, manage safety of electrical installations of the state and collection of revenue on electricity duty, electrical inspection, monitoring and implementation of Small Hydro Projects, Rural Electrification etc. It has also been declared as State Designated Agency (SDA) by the State Government to coordinate, Regulate and Enforce Provision of Energy Conservation Act, 2001 in the State. • In order to improve the Electricity supply condition and to reduce the Technical & Commercial loss in Power Sector and to punish the people as per the prevailing law involved in the electricity theft, the State Govt have till date established 34 Electricity Police Station.		

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR	Budget provison (2013-14) if lastyear - Crore
ENERGY/ KP/3	Reduction of T & D losses: Develop an operational plan for a targeted reduction of losses due to pilferage and outdated systems (estimated to be about 40%). The activity includes augmentation of T & D infrastructure and investment plan, enhancing present practices for improved load management & feasibility study of evacuation corridors	CAPEX – was launched to improve T&D infrastructure of the State to enhance quality and reliability power supply to the consumer with objective to reduce the losses. ODSSP – envisaged construction of 520 nos. of new 33/11kv sub-stations along with associated networks to addressed low voltage problem as well as loss reduction in rural area. DISASTER RESILIENT POWER SYSTEM- To convert all 33 KV and 11 KV lines in 50 KM radius of the costal line with NBLS towers and H-poles to withstand high wind speed over 300 KM/hr and also to make them disaster resilient. SCRIPS- Due to tremendous infrastructure growth in and around Bhubaneswar city there is immediate need of need to expand and strengthen the existing power infrastructure to provide 24X7 un-interrupted power supply. Redial to ring conversion project - is conceptualized both in distribution and transmission system at 220 KV, 132 KV, 33 KV and 11 KV lines to provide un-interrupted power supply in case of any disturbance due to either sub-station or line failure throughout the State. Underground cabling of Lingaraj Ratha Road and development programme of electrical system improvement (INR 8.48 cr. and INR 200 cr.) Smart Grid- To keep a pace of modernization, growth of consumer network and to provide quality power supply the SMART Grid automation adoption in Distribution and Transmission utility is immensely needed.	5500	343.48

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR	Budget provison (2013-14) if lastyear - Crore
ENERGY/ KP/4	DSM/EE: Develop a comprehensive policy and plan to save energy use in order to reduce the demand – supply gap and contribute towards climate change abatement including the following measures: • Implementation of utility level DSM measures – Policy action • Awareness Generation for Energy Conservation • Promotion and implementation of the National BEE's ECBC code for widespread adoption in the state to reduce the energy consumption in buildings. • Forproperenergy monitoring, capacity building of energy auditors, strengthening of existing energy conservation Cell supported with manpower and infrastructure.	Energy Conservation impleme-ntation works for 2014-15 • In order to implement Energy Conservation Act, 2001 in its real term Odisha Energy Conservation Building Code (ECBC) framed for execution in the State. Odisha State Energy Conservation Fund Rule has been framed for promoting energy conservation in the State. • A State level scheme for promoting energy efficiency in the government sector in participatory mode has been framed. • As a part of energy conservation action plan, Investment Grade Energy Audit (IGEA) of 20 government buildings including Odisha Legislative Assembly, State Secretariat, Raj Bhawan, Jayadev Bhawan, Capital Hospital etc. have been completed. • This study with more than 14 MVA contract demand and more than 11 MW of connected load has explored and energy saving potential of more than 2 MW. • Besides, energy audit has been completed in OMFED Diary Plant and thereby an energy saving of 25% has been explored by the study. • Four major pumping stations, Mundali, Berhampur, Bolangir and Bhubaneswar have been identified and DPRs are being prepared for implementation of the measures.	460	12

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR	Budget provison (2013-14) if lastyear - Crore
		• 100 new buildings have been finalized for taking energy audit including district Collectorate and district Headquarter Hospital in the State. • LED village (Light Emitting Diodes) campaign launched by Bureau of Energy Efficiency (BEE) and Government of India 2 villages viz; Raghurajpur (Craft village) and Satyabhamapur (birth place of Utkal Gourav Madhusudan Das) have been taken as a part of nationwide LED village campaign. OPGC has taken following steps for Energy Conservation: • Adoption of energy conservation measures & energy efficient technology has been already planned & included in township expansion & renovation plant to be carried out during 2014-15. • 5* rating AC machine is being procured. T-5, CFL lightings are procured for street lighting. 15 numbers of LED street lights have been fitted. In the coming financial year, it is planned to fix 200 more LED street lights.		
ENERGY/ KP/6	Promotion of Small and Medium Hydel plants	For Promoting SHEP, OHPC has taken up following steps – 1.Pre-feasibility report on Jurakhamon-2.5 MW, Khilamunda-1.2 MW, Mushal-4 MW, Chheligarh-5.2 MW projects has been prepared. ii. Work order for preparation of prefeasibility report on Kharag,1, II, III, IV of 18 MW each have already been issued. iii. Negotiation is going on with Rourkela Steel Plant (SAIL) for setting up of a SHEP at Mandira Dam.	41	

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR	Budget provison (2013-14) if lastyear - Crore
ENERGY/ KP/7	Enhancing bio-mass potential		10	0.1
ENERGY/ KP/8	Promotion of Grid based wind power			5.1
ENERGY/ KP/9	Maximize solar power generation in the state in both PV and thermal routes and increase the penetration of standalone solar systems for use by institutions, communities and individuals	Power & power from SHEP, GEDCOL has been formed. And Financial Advisory Serving Agreement has been signed with IFC for setting up of roof top Solar plants at twin city of Bhubaneswar –Cuttack. On the first phase, it is proposed to install solar photovoltaic panels utilizing non-residential Govt. building only. According, survey & investigation work is going on both the cities. OPGC has taken following steps: 2. Provision of solar water heating system in guest house & canteen is going to be executed in 2014. 3. As regard the installation of solar PV panel for plant service building & resource centre lighting load, the feasibility has been studied and the proposal has been dropped due to not cost effective.	100	0.3
ENERGY/ KP/10	Bio-gas and manure management			6.5
		TOTAL	**6151.00**	**367.48**

Adaptation	0.00
Mitigation	367.48
Both	0.00
Total	**367.48**

Capacity Building	0.00
Investment	361.98
Pilot/Demo	5.2
Policy Action	0.3
Pre-Investment	0.00
Research Study	0.00
Total	**367.48**

FISHERY & ARD

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs Crore
FARD/KP/7	Disease Early Warning System	Development of Early Warning System of Livestock Diseases with relation to Climate Change in Odisha	2.00	
FARD/KP/8	Impact of climate change on animal husbandry application of biotechnology and skilled animal breeding for development of better adopted species	Application of Biotechnology and Skilled Animal Breeding for development of better adapted livestock breeds in Odisha	2.00	
FARD/KP/9	Capacity building of livestock keepers	Capacity Building Programme on Climate Change	2.50	
FARD/KP/10	Impact of climate change on inland and coastal aquaculture	Alternative livelihood due to ban & Shifting of Fishing Ground (scale of activity- Coastal areas of the state)	3.00	8.00
		Research Study on climate change & its impact on Fisheries (Inland & Marine) [scale of activity- State Wide]		0.20
FARD/KP/11	Development of infrastructure for early warning systems in coastal areas for fisheries	Awareness among stake holders on climate change (scale of activity- Coastal areas of the state)	5.00	0.004
		Set up of early warning System infrastructures for Natural Calamities (scale of activity- Coastal areas of the state)		3.00
FARD/KP/12	Welfare activities	Savings cum relief	24.00	0.84
		Assistance under matsyajibi basagruha yojana		7.75
		Group Insurance		2.90
		Low cost housing		**5.00**
		TOTAL	**38.50**	**27.69**

Adaptation	27.69
Mitigation	0.00
Both	0.00
Total	**27.69**

Capacity Building	0.00
Investment	19.49
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	8.20
Total	**27.69**

FORESTRY

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs- Crore
FOR/KP/1	Increasing reforestation/ afforestation activities in degraded forest areas	(i) AR:39,122ha, (ii) ANR: 24,966 ha - Total: 78,319 ha.	2400.00	255.06
FOR/KP/2	Protecting existing forest stocks to act as carbon sink with stronger conservation	48,90,000Sq KM	500.00	10.37
FOR/KP/3	Increasing planting on non forest land and also exploring where new and increased tree planting could create barriers to storm and cyclone impacts in coastal zones.	Distribution of Seedlings to the Beneficiary/farmers to be planted in the land outside forest areas: 5.5 Crores Seedlings Coastal Shelter Belt Plantations: 2,200 ha.	50.00	26.20
FOR/KP/4	Covering bald hills with suitable species mix	1000 ha	20.00	11.10
FOR/KP/5	Increasing and protecting existing mangrove cover along the coast	Mangrove Plantation for 300 ha	100.00	1.03
FOR/KP/6	Assessing fire management strategies	Entire Forest Areas	100.00	0.00
FOR/KP/7	Improving tree planting and forest management to integrate with watersheds and water resources management	Drainage line treatment, Check dams, percolation tanks, planting pits, etc	1200.00	6.00
FOR/KP/8	Working to establish new systems to support for community users	LLI initiatives under OFSDP project to the VSS members in order to reduce pressure on Forests - Entire Project Areas	50.00	0.29
FOR/KP/9	Undertaking studies on indigenous tree species to assess their vulnerability to climate change	Research studies to address the issues of adaptation concerning tree genotypes particularly indigenous species	10.00	
FOR/KP/10	Assessing additional threats to biodiversity and wildlife	Continuous monitoring of the ecosystems to determine when & what changes occurs	100.00	

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs- Crore
FOR/KP/11	Obtaining access to updated knowledge on climate change science and policy development	To sensitize the front line managers, policy makers & essentially staff at all levels of the forest department.	10.00	
FOR/KP/12	Capacity building of JFM & CFM Committees and Panchayati Raj Institutions to adapt to climate change	A series of trainings & awareness generation programmes will be undertaken. Wherever voluntary initiatives to protect forests exist those would be recognized & strengthened	5.00	
FOR/KP/13	Monitoring carbon stock and biodiversity at regular intervals	Developing a new & independent org. a forest monitoring agency under the Forest department will be undertaken	5.00	
		TOTAL	**4550.00**	**310.05**

Adaptation	6.29
Mitigation	1.03
Both	302.73
Total	**310.05**

Capacity Building	0.00
Investment	303.76
Pilot/Demo	6.29
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**310.05**

HEALTH AND FW

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14)
HEALTH/KP/3	Strengtheningapproaches to manage Vector Borne Disease that have worsened due to climate change impacts	Construction of hatchery for biological control of mosquito	75.00	0.03
		Mechanism for monitoring of activities under Integrated Vector Management (IVM) by MPHS (Multipurpose Health Supervisors)		
		Construction of soak-pits for insecticide disposal		
HEALTH/KP/4	Strengtheningapproaches to deal with Heat Wave Conditions exacerbated due to climate change	Strengthening approaches to deal with Heat Wave Conditions exacerbated due to climate change (Justification, Scope of Activity and further expansion)	165.00	30.00
HEALTH/KP/7	Undertaking measures to manage Water Borne Disease that have worsened due to climate change impacts	Undertaking measures to manage Water Borne Disease that have worsened due to climate change impacts	30.00	
		TOTAL	**270.00**	**30.03**

Adaptation	30.03
Mitigation	0.00
Both	0.00
Total	**30.03**

Capacity Building	30.00
Investment	0.00
Pilot/Demo	0.03
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**30.03**

H&UD

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs Crore
HUD/KP/1	To orient and sensitize the stakeholders at all levels of ULBs towards issues related to climate change and capacitate them for carrying out the planning and execution of different activities under comprehensive capacity building programme.	Conduct the training programmes covering the aspects on challenges and combating the issues in climate change and their respective roles and responsibilities.	20	
		Conduct an exposure visit of the officials to the cities where projects to combat the climate change challenges were implemented		
		Preparation & distribution of IEC materials including environment building activities on adaption measures to climate change.		
HUD/KP/3	Reduction in non-revenue water loss by undertaking IEC activities, introducing volumetric water metering system, installation of energy efficient pumps, storage facilities, source sustainability measures and ensuring water assessment and audit.	Planning, execution & commissioning of energy efficient measures.	5	
		Water Audit and Bulk metering system		
		Commissioning of computerization & e-Governance initiatives in water supply system		
		Implementation of Capacity Development activities and DPR preparation for ensuring safe drinking water to the citizens.		

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs Crore
HUD/KP/4	To develop and implement MSW management plans in 5 selected ULBs i.e., Bhubaneswar, Berhampur, Sambalpur, Paradeep and Puri and prepare such plans for state wide implementation in full compliance to MSW Rules, 2010.	Implementation of the MSW management projects in Bhubaneswar, Berhampur, Sambalpur, Paradeep and Puri cities.	300	
		To plan and implement Solid Waste Management Projects in Balugaon, Bhadrak, Jagatsinghpur, Gopalpur and Konark under ICZMP		
HUD/KP/5	To introduce energy efficient street lighting in cities of Bhubaneswar, Cuttack, Berhampur, Rourkela & Sambalpur and piloting the same through a CDM proposal.	Implementation of energy efficient street lighting projects on PPP mode in Bhubaneswar city.	20	
		Implementing the PPP projects in Cuttack, Berhampur, Rourkela and Sambalpur cities in Phase-1		
		Conducting the impact assessment and approach towards CDM.		
HUD/KP/6	To strengthen all the 106 Master Plan/CDP of the State by incorporating measures to combat climate change.	Study and revise GIS/RS based Master Plan of all ULBs in compliance to adaptive measures of climate change	50	
		Preparation of City Development Plans (CDPs) for 15 selected ULBs to identify projects to combat the issues of climate change through multiple stakeholder consultations.		
		Conduct training sessions& exposure visits for officials involved in preparing Master Plans to get sensitized in different phases.		

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs Crore
HUD/KP/7	Introduction of city bus service and low carbon transport system as a feeder service to the proposed Mass Rapid Transit System (MRTS) in Bhubaneswar-Cuttack Urban agglomeration.	Undertake preparation of Detail Project Report (DPR) for Mass Rapid Transit System between Bhubaneswar and Cuttack	500	
		Implementation of the Bus Rapid Transit system (BRTS) in Bhubaneswar city in the selected routes on pilot basis		
		Introduction of City Bus Services in Berhampur- Gopalapur-Chhatrapur- Hinjlicut and Samabalpur- Hirakud-Burla-Jharsuguda clusters		
		Introduction of City Bus Services in Cuttack – Choudwar , Jeypore – Koraput – Sunabeda and Balasore – Bhadrak clusters		
HUD/KP/9	Developing models of urban storm water flows and capacities of existing drainage systems in selected city with climate change	Implementation of the Drainage system improvement projects in Balasore, Bhadrak, Kendrapara, and Konark cities / towns of Odisha under ICZMP	100	
		Implementation of the Storm Water Drainage system project in Jajpur Town.		
		TOTAL	**995.00**	**0**

Adaptation	0.00
Mitigation	0.00
Both	0.00
Total	**0.00**

Capacity Building	0.00
Investment	0.00
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**0.00**

INDUSTRY

KP Code	Title of Project	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs Crore
IND/KP/ 1	Integrate climate concerns in policies and plans for industrial development and related areas	30	
IND/KP/ 2	Prepare GHG profile of major industrial cluster	10	
IND/KP/ 3	Heat-island study for Talcher and Jharsuguda area	10	0.10
IND/KP/ 4	Training various stakeholders on climate change issues	62	0.075
IND/KP/ 5	Implement a system of compensatory water harvesting	100	
IND/KP/ 6	Streamline institutional arrangement and strengthen OSDMA to tackle extreme climate events in coastal area	110	
IND/KP/ 7	Carry out energy efficiency study for iron & steel, thermal power, cement and aluminium sector	10	
IND/KP/ 8	Promote use of bulk waste material like flyash, dolo char, slag etc.	10	
IND/KP/ 9	Setting emission targets for thermal power plants	10	
	Total	**352**	**0.175**

Adaptation	0.100
Mitigation	0.00
Both	0.075
Total	**0.175**

Capacity Building	0.075
Investment	0.00
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.100
Total	**0.175**

TRANSPORT

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) in Rs Crore
TRANSPORT/KP/3	Introduction of MRTS	3 nos of 30 seater FRP procurment	4.00	0.93
TRANSPORT/KP/10	Survey of ambient air quality towns/cities			1.21
TRANSPORT/KP/14	Developing inland waterways		5.00	2.08
	TOTAL		**9.00**	**4.22**

Adaptation	0.93
Mitigation	3.29
Both	0.00
Total	**4.22**

Capacity Building	0.00
Investment	0.93
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	2.08
Research Study	1.21
Total	**4.22**

WATER

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs Crore
WATER/KP/1	Expansion of Hydrometry network	River discharge observation stations, along with automatic rain gauge with Automatic transmission system (No of observation stations-107 {AWS-23,WLS-20,ARG-64})	15.00	8.8
WATER/KP/2	Development of Flood Forecasting Model	Forecast and early warnign system	2.00	0
WATER/KP/4	Increasing the water use efficiency in irrigation projects. Water audit, Benchmarking, monitoring & pricing (pilot study)	Increasing the water use efficiency in irrigation projects through Comand Area Development(CADA) (45000 Ha)	20.00	0.01
		Additional Activities, lining of canals in Major & Medium irrigation Projects (Under CLSRP) (23 nos)		92.95
		Lining of Canals in Minor irrigation Projects (Under CLSRP)(34 nos)		
WATER/KP/5	Constructing and protecting water harvesting structures	For enhancement of in-stream storage through construction of check dams(6000 nos)	470.00	243.08
		Additional Activities, Creation of additional storage through renovations of tanks under minor irrigation (under RRR schemes) (541 nos)		100.00
		Renovation of MI tanks under Odisha Community Tank Management Projects (OCTMP) (324 nos)		42.00

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2013-14) Rs Crore
WATER/KP/6	Improvement of drainage system	To mitigate drainage congestion, reclamation of cultivable land & reuse of drainage water for irrigation	200.00	117.42
WATER/KP/7	River health monitoring	Ecosystem and environmental flow demand studies	2.00	0.43
WATER/KP/8	Raising awareness with Pani Panchayat through farmers' training programme	Implementing IWRM concept in the basin through participatory management. Conservation of water resources through optimal use of water. Engagement of NGO's for raising awareness (45/900- nos/ persons)	5.00	0.58
WATER/KP/9	Integrated water resource management	Implementing IWRM concept in the basin through participatory management. Conservation of water resources through optimal use of water. Engagement of NGO's for raising awareness (80/4000- nos/ persons)	10.00	0.00
		TOTAL	**724.00**	**605.27**

Adaptation	220.19
Mitigation	385.08
Both	0.00
Total	**605.27**

Capacity Building	0.58
Investment	604.26
Pilot/Demo	0.43
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**605.27**

PROGRESS MONITORING SHEET - 2012-13

AGRICULTURE

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) Crore
AG/KP/3	Capacity building of farmers and extension workers	Training programme for farmers under RKVY (1000 nos)	54.00	
		Training programme for farmers under State Employment Mission (1932 nos)		0.77
		Training programme for farmers under ATMA/State Plan (5000 nos)		
		Training programme for farmers under National Horticulture Mission (3900 nos)		
AG/KP/4	Livelihood focussed people centric integrated watershed development programmes in rainfed areas vulnerable to climate variation	1.69 lakh ha	1000.00	196.98
AG/KP/5	Increasing the area under perennial fruit plantation to help cope with uncertain weather patterns		50.00	18.51
AG/KP/6	Developing water efficient micro irrigation methods and individual/ community farm ponds	Development of micro irrigation under NMMI (20000 ha)		
		Individual/community farm pond (3000 nos)		
AG/KP/7	Improving monitoring and surveillance technique in the context of climate change		24.00	2.20
		TOTAL	**1128.00**	**218.46**

Adaptation	2.97
Mitigation	18.51
Both	196.98
Total	**218.46**

Capacity Building	0.77
Investment	196.98
Pilot/Demo	20.71
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**218.46**

COAST AND DISASTER MANAGEMENT

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) - Crore
CD/KP/5	Construction of flood shelters in unconventionally vulnerable locations (i.e. traditionally dry areas facing flooding and water logging due to climate change) and strengthening the community to face the changing patterns of adaptation	Construction of multi-purpose flood shelters	100.00	
CD/KP/6	Need assessment and construction of multipurpose cyclone shelters in the cyclone prone areas of the state along with provision of emergency equipment to the Cyclone shelters and strengthening the capacity of the local people for disaster management.	Construction of multi-purpose cyclone shelters *(completed)*	400.00	36.15
CD/KP/12	Setting up an integrated training and capacity building protocol for raising the level of awareness of the community and major stakeholders with respect to the mitigation and adaptation mechanism arising due to effects of climate change on agriculture and livelihood support system and disaster preparedness	Setting up of an Integrated Training and Capacity Building Institute for Disaster Management	100.00	
		TOTAL	**600.00**	**36.15**

Adaptation	36.15
Mitigation	0.00
Both	0.00
Total	**36.15**

Capacity Building	0.00
Investment	36.15
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**36.15**

ENERGY

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) if lastyear - Crore
ENERGY/ KP/2	Institutional development (Capacity building/ restructuring) of Energy Department for implementing policies and conducting studies consisting of following activities. 1. Functional Reorganization And Capacity Building of The Energy Department, OERC & OREDA To Have A Coherent Road Map to achieve efficient functioning and implementation of energy efficiency, energy conservation, promotion of renewable energy. 2. Integrated Super critical (660 MW) IPP Policy (Coal Washeries, Fly Ash based cement and brick plants) Minimum unit size for the purpose of IPP/ MPP should not be less than 300 MW to achieve minimum standards of efficiency. 3. Revised RPO based on the Changing Load mix and Assessment of Evacuation Infrastr-ucture	GEDCOL has been formed with main objective of 1. To promote investment to renewable energy projects & various green energy sources & to develop & execute special renewable energy project in commercial and / or demonstration basis. 2. To plan, organise, implement maintains and operate renewable energy projects to generate & sell electric power only. EIC (Electricity)-cum-PCEI Office has been re-organized 1. As administrative head of Electrical inspectorate and project wings of Energy Dept. Chief Electrical Inspector, T&D and Chief Engineer(Projects)-Cum-Chief Electrical Inspection (Gen) are under the administrative control of E.I.C. (Electricity). The total strength of Electrical Engineers under the administrative control of E.I.C. (Electricity) is as follows: EIC(Electricity)-cum-PCEI : 01 Chief Engineers : 06 Superintending Engineers : 09 (L-I) Superintending Engineers : 06 (L-II) Executive Engineers : 49 Deputy Executive Engineers : 17 Asst. Executive Engineers : 127 Asst. Engineers : 61	40	

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) if lastyear - Crore
	4. To conduct a study for determination of State Emission intensity Develop an operational plan for the Fund that will get revenue for the sale of power that is exported. 5. Feasibility study of establishment of coal based thermal power plants along coast of Orissa, use of saline water and dedicated rail corridor for coal transportation to be conducted. • Feasibility of Implementation of emerging Clean Coal Technologies through pilot projects in Orissa Training of the Members of working group or their representatives of different departments and organisations on sector specific climate change issues.	• E.I.C. (Elec.) –Cum-PCEI has the responsibilities to plan and develop the safety procedures, manage safety of electrical installations of the state and collection of revenue on electricity duty, electrical inspection, monitoring and implementation of Small Hydro Projects, Rural Electrification etc. It has also been declared as State Designated Agency (SDA) by the State Government to coordinate, Regulate and Enforce Provision of Energy Conservation Act, 2001 in the State. • In order to improve the Electricity supply condition and to reduce the Technical & Commercial loss in Power Sector and to punish the people as per the prevailing law involved in the electricity theft, the State Govt have till date established 34 Electricity Police Station.		
ENERGY/ KP/3	Reduction of T & D losses: Develop an operational plan for a targeted reduction of losses due to pilferage and outdated systems (estimated to be about 40%). The activity includes augmentation of T & D infrastructure and investment plan, enhancing present practices for improved load management & feasibility study of evacuation corridors	CAPEX – was launched to improve T&D infrastructure of the State to enhance quality and reliability power supply to the consumer with objective to reduce the losses. ODSSP – envisaged construction of 520 nos. of new 33/11kv sub-stations along with associated networks to addressed low voltage problem as well as loss reduction in rural area.	5500	251.26

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) if lastyear - Crore
		DISASTER RESILIENT POWER SYSTEM- To convert all 33 KV and 11 KV lines in 50 KM radius of the costal line with NBLS towers and H-poles to withstand high wind speed over 300 KM/hr and also to make them disaster resilient. SCRIPS- Due to tremendous infrastructure growth in and around Bhubaneswar city there is immediate need of need to expand and strengthen the existing power infrastructure to provide 24X7 un-interrupted power supply. Redial to ring conversion project - is conceptualized both in distribution and transmission system at 220 KV, 132 KV, 33 KV and 11 KV lines to provide un-interrupted power supply in case of any disturbance due to either sub-station or line failure throughout the State. Underground cabling Grand Road Puri. Smart Grid- To keep a pace of modernization, growth of consumer network and to provide quality power supply the SMART Grid automation adoption in Distribution and Transmission utility is immensely needed.		

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) if lastyear - Crore
ENERGY/ KP/4	DSM/EE: Develop a comprehensive policy and plan to save energy use in order to reduce the demand – supply gap and contribute towards climate change abatement including the following measures: • Implementation of utility level DSM measures – Policy action • Awareness Generation for Energy Conservation • Promotion and implementation of the National BEE's ECBC code for widespread adoption in the state to reduce the energy consumption in buildings. For proper energy monitoring, capacity building of energy auditors, strengthening of existing energy conservation Cell supported with manpower and infrastructure.	Energy Conservation implementation works for 2014-15 • In order to implement Energy Conservation Act, 2001 in its real term Odisha Energy Conservation Building Code (ECBC) framed for execution in the State. Odisha State Energy Conservation Fund Rule has been framed for promoting energy conservation in the State. • A State level scheme for promoting energy efficiency in the government sector in participatory mode has been framed. • As a part of energy conservation action plan, Investment Grade Energy Audit (IGEA) of 20 government buildings including Odisha Legislative Assembly, State Secretariat, Raj Bhawan, Jayadev Bhawan, Capital Hospital etc. have been completed. • This study with more than 14 MVA contract demand and more than 11 MW of connected load has explored and energy saving potential of more than 2 MW. • Besides, energy audit has been completed in OMFED Diary Plant and thereby an energy saving of 25% has been explored by the study.	460	15.00

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) if lastyear - Crore
		• Four major pumping stations, Mundali, Berhampur, Bolangir and Bhubaneswar have been identified and DPRs are being prepared for implementation of the measures. • 100 new buildings have been finalized for taking energy audit including district Collectorate and district Headquarter Hospital in the State. • LED village (Light Emitting Diodes) campaign launched by Bureau of Energy Efficiency (BEE) and Government of India 2 villages viz; Raghurajpur (Craft village) and Satyabhamapur (birth place of Utkal Gourav Madhusudan Das) have been taken as a part of nationwide LED village campaign. OPGC has taken following steps for Energy Conservation: • Adoption of energy conservation measures & energy efficient technology has been already planned & included in township expansion & renovation plant to be carried out during 2014-15. • 5* rating AC machine is being procured. T-5, CFL lightings are procured for street lighting. 15 numbers of LED street lights have been fitted. In the coming financial year, it is planned to fix 200 more LED street lights.		

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) if lastyear - Crore
ENERGY/ KP/6	Promotion of Small and Medium Hydel plants	For Promoting SHEP, OHPC has taken up following steps – 1.Pre-feasibility report on Jurakhamon-2.5 MW, Khilamunda-1.2 MW, Mushal-4 MW, Chheligarh-5.2 MW projects has been prepared. ii. Work order for preparation of prefeasibility report on Kharag,1, II, III, IV of 18 MW each have already been issued. iii. Negotiation is going on with Rourkela Steel Plant (SAIL) for setting up of a SHEP at Mandira Dam.	41	
ENERGY/ KP/9	Maximize solar power generation in the state in both PV and thermal routes and increase the penetration of standalone solar systems for use by institutions, communities and individuals	1. To promote the generation of Solar Power & power from SHEP, GEDCOL has been formed. And Financial Advisory Serving Agreement has been signed with IFC for setting up of roof top Solar plants at twin city of Bhubaneswar –Cuttack. On the first phase, it is proposed to install solar photovoltaic panels utilizing non-residential Govt. building only. According, survey & investigation work is going on both the cities. OPGC has taken following steps: 2. Provision of solar water heating system in guest house & canteen is going to be executed in 2014. 3. As regard the installation of solar PV panel for plant service building & resource centre lighting load, the feasibility has been studied and the proposal has been dropped due to not cost effective.	100	0.7724

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) if lastyear - Crore
ENERGY/ KP/10	Development of Bio-gas and manure management incld. Examinign bio-fuel policy of the state			7.3
		TOTAL	**6141.00**	**274.33**

Adaptation	0.00
Mitigation	274.33
Both	0.00
Total	**274.33**

Capacity Building	0.00
Investment	273.56
Pilot/Demo	0.7724
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**274.33**

FISHERY AND ANIMAL RESOURCES

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) Crore
FARD/KP/7	Disease Early Warning System	Development of Early Warning System of Livestock Diseases with relation to Climate Change in Odisha	2.00	
FARD/KP/8	Impact of climate change on animal husbandry application of biotechnology and skilled animal breeding for development of better adopted species	Application of Biotechnology and Skilled Animal Breeding for development of better adapted livestock breeds in Odisha	2.00	
FARD/KP/9	Capacity building of livestock keepers	Capacity Building Programme on Climate Change	2.50	
FARD/KP/10	Impact of climate change on inland and coastal aquaculture	Alternative livelihood due to ban & Shifting of Fishing Ground (scale of activity- Coastal areas of the state)	3.00	8.00
		Two Research Studies on climate change & its impact on Fisheries (Inland & Marine) [scale of activity- State Wide]		0.20
FARD/KP/7	Development of infrastructure for early warning systems in coastal areas for fisheries	Awareness among stake holders on climate change (scale of activity- Coastal areas of the state) 20 camps	5.00	0.004
		Set up of early warning System infrastructures for Natural Calamities (scale of activity- Coastal areas of the state)		3.00
FARD/KP/11	Welfare activities	Savings cum relief	24.00	1.31
		Group Insurance		2.90
		Low cost housing		
		TOTOL	**38.50**	**15.41**

Adaptation	15.41
Mitigation	0.00
Both	0.00
Total	**15.41**

Capacity Building	3.00
Investment	4.21
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	8.20
Total	**15.41**

FORESTRY

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) Crore
FOR/KP/1	Increasing reforestation/ afforestation activities in degraded forest areas	(i) AR: 39,122 ha, (ii) ANR: 1,10,746 ha- Total: 1,49,868 ha.	2400.00	200.23
FOR/KP/2	Protecting existing forest stocks to act as carbon sink with stronger conservation	48,90,000 Sq KM	500.00	9.27
FOR/KP/3	Increasing planting on non forest land and also exploring where new and increased tree planting could create barriers to storm and cyclone impacts in coastal zones.	Distribution of Seedlings to the Beneficiary/farmers to be planted in the land outside forest areas: 5.5 Crores Seedlings Coastal Shelter Belt Plantations: 2,200 ha.	50.00	7.33
FOR/KP/4	Covering bald hills with suitable species mix	1000 ha	20.00	6.00
FOR/KP/5	Increasing and protecting existing mangrove cover along the coast	Mangrove Plantation for 307 ha	100.00	1.89
FOR/KP/6	Assessing fire management strategies	Entire Forest Areas	100.00	6.17
FOR/KP/7	Improving tree planting and forest management to integrate with watersheds and water resources management	Drainage line treatment, Check dams, percolation tanks, planting pits, etc	1200.00	15.27
FOR/KP/8	Working to establish new systems to support for community users	LLI initiatives under OFSDP project to the VSS members in order to reduce pressure on Forests - Entire Project Areas	50.00	0.23
FOR/KP/9	Undertaking studies on indigenous tree species to assess their vulnerability to climate change	Research studies to address the issues of adaptation concerning tree genotypes particularly indigenous species	10.00	
FOR/KP/10	Assessing additional threats to biodiversity and wildlife	Continuous monitoring of the ecosystems to determine when & what changes occurs	100.00	

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) Crore
FOR/KP/11	Obtaining access to updated knowledge on climate change science and policy development	To sensitize the front line managers, policy makers & essentially staff at all levels of the forest department.	10.00	
FOR/KP/12	Capacity building of JFM & CFM Committees and Panchayati Raj Institutions to adapt to climate change	A series of trainings & awareness generation programmes will be undertaken. Wherever voluntary initiatives to protect forests exist those would be recognized & strengthened	5.00	
FOR/KP/13	Monitoring carbon stock and biodiversity at regular intervals	Developing a new & independent org. a forest monitoring agency under the Forest department will be undertaken	5.00	
		TOTAL	**4550.00**	**246.39**

Adaptation	21.67
Mitigation	1.89
Both	222.83
Total	**246.39**

Capacity Building	0.00
Investment	232.83
Pilot/Demo	13.56
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**246.39**

HEALTH & FAMILY WELFARE

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR	Budget provison (2012-13) Crore
HEALTH/KP/3	Strengthening approaches to manage Vector Borne Disease that have worsened due to climate change impacts	Construction of hatchery for biological control of mosquito	75.00	
		Mechanism for monitoring of activities under Integrated Vector Management (IVM) by MPHS (Multipurpose Health Supervisors)		
		Construction of soak-pits for insecticide disposal		
HEALTH/KP/4	Strengthening approaches to deal with Heat Wave Conditions exacerbated due to climate change	Strengthening approaches to deal with Heat Wave Conditions exacerbated due to climate change (Justification, Scope of Activity and further expansion)	**165.00**	
HEALTH/KP/7	Undertaking measures to manage Water Borne Disease that have worsened due to climate change impacts	Undertaking measures to manage Water Borne Disease that have worsened due to climate change impacts	**30.00**	
		TOTAL	**270.00**	**0.00**

Adaptation	0.00
Mitigation	0.00
Both	0.00
Total	**0.00**

Capacity Building	0.00
Investment	0.00
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**0.00**

HOUSING AND URBAN DEVELOPMENT

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) Crore
HUD/KP/1	To orient and sensitize the stakeholders at all levels of ULBs towards issues related to climate change and capacitate them for carrying out the planning and execution of different activities under comprehensive capacity building programme.	Conduct the training programmes covering the aspects on challenges and combating the issues in climate change and their respective roles and responsibilities.	20	
		Conduct an exposure visit of the officials to the cities where projects to combat the climate change challenges were implemented		
		Preparation & distribution of IEC materials including environment building activities on adaption measures to climate change.		
HUD/KP/3	Reduction in non-revenue water loss by undertaking IEC activities, introducing volumetric water metering system, installation of energy efficient pumps, storage facilities, source sustainability measures and ensuring water assessment and audit.	Planning, execution & commissioning of energy efficient measures.	5	
		Water Audit and Bulk metering system		
		Commissioning of computerization & e-Governance initiatives in water supply system		
		Implementation of Capacity Development activities and DPR preparation for ensuring safe drinking water to the citizens.		
HUD/KP/4	To develop and implement MSW management plans in 5 selected ULBs i.e., Bhubaneswar, Berhampur, Sambalpur, Paradeep and Puri and prepare such plans for state wide implementation in full compliance to MSW Rules, 2010.	Implementation of the MSW management projects in Bhubaneswar, Berhampur, Sambalpur, Paradeep and Puri cities.	300	
		To plan and implement Solid Waste Management Projects in Balugaon, Bhadrak, Jagatsinghpur, Gopalpur and Konark under ICZMP		

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) Crore
HUD/KP/5	To introduce energy efficient street lighting in cities of Bhubaneswar, Cuttack, Berhampur, Rourkela & Sambalpur and piloting the same through a CDM proposal.	Implementation of energy efficient street lighting projects on PPP mode in Bhubaneswar city.	20	
		Implementing the PPP projects in Cuttack, Berhampur, Rourkela and Sambalpur cities in Phase-1		
		Conducting the impact assessment and approach towards CDM.		
HUD/KP/6	To strengthen all the 106 Master Plan/CDP of the State by incorporating measures to combat climate change.	Study and revise GIS/RS based Master Plan of all ULBs in compliance to adaptive measures of climate change	50	
		Preparation of City Development Plans (CDPs) for 15 selected ULBs to identify projects to combat the issues of climate change through multiple stakeholder consultations.		
		Conduct training sessions& exposure visits for officials involved in preparing Master Plans to get sensitized in different phases.		
HUD/KP/7	Introduction of city bus service and low carbon transport system as a feeder service to the proposed Mass Rapid Transit System (MRTS) in Bhubaneswar-Cuttack Urban agglomeration.	Undertake preparation of Detail Project Report (DPR) for Mass Rapid Transit System between Bhubaneswar and Cuttack	500	
		Implementation of the Bus Rapid Transit system (BRTS) in Bhubaneswar city in the selected routes on pilot basis		
		Introduction of City Bus Services in Berhampur-Gopalapur-Chhatrapur- Hinjlicut and Samabalpur- Hirakud- Burla-Jharsuguda clusters		
		Introduction of City Bus Services in Cuttack – Choudwar , Jeypore – Koraput – Sunabeda and Balasore – Bhadrak clusters		

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) Crore
HUD/KP/9	Developing models of urban storm water flows and capacities of existing drainage systems in selected city with climate change	Implementation of the Drainage system improvement projects in Balasore, Bhadrak, Kendrapara, and Konark cities /towns of Odisha under ICZMP	100	
		Implementation of the Storm Water Drainage system project in Jajpur Town.		
		TOTAL	**995.00**	**0**

Adaptation	0.00
Mitigation	0.00
Both	0.00
Total	**0.00**

Capacity Building	0.00
Investment	0.00
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**0.00**

INDUSTRY

KP Code	Title of Project	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) last yr - Crore
IND/KP/ 1	Integrate climate concerns in policies and plans for industrial development and related areas	30	
IND/KP/ 2	Prepare GHG profile of major industrial cluster	10	
IND/KP/ 3	Heat-island study for Talcher and Jharsuguda area	10	
IND/KP/ 4	Training various stakeholders on climate change issues	62	
IND/KP/ 5	Implement a system of compensatory water harvesting	100	
IND/KP/ 6	Streamline institutional arrangement and strengthen OSDMA to tackle extreme climate events in coastal area	110	
IND/KP/ 7	Carry out energy efficiency study for iron & steel, thermal power, cement and aluminium sector	10	
IND/KP/ 8	Promote use of bulk waste material like flyash, dolo char, slag etc.	10	
IND/KP/ 9	Setting emission targets for thermal power plants	10	
	TOTAL	**352**	**0**

Adaptation	0.00
Mitigation	0.00
Both	0.00
Total	**0.00**

Capacity Building	0.00
Investment	0.00
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**0.00**

TRANSPORT

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) Crore
TRANSPORT/ KP/3	Introduction of MRTS	Procurement of 3 nos of 30 seater FRP	4.00	0.39
TRANSPORT/ KP/14	Developing inland waterways	Five water route survey	5.00	0.77
		Total	**9.00**	**1.16**

Adaptation	0.39
Mitigation	0.77
Both	0.00
Total	**1.16**

Capacity Building	0.00
Investment	0.39
Pilot/Demo	0.00
Policy Action	0.77
Pre-Investment	0.00
Research Study	0.00
Total	**1.16**

WATER RESOURCES

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) - Crore
WATER/KP/1	ExpansionofHydrometry network	"River discharge observation stations, along with automatic rain gauge with Automatic transmission system (No of observation stations-107 {AWS-23,WLS-20, ARG-64})"	15.00	4.7
WATER/KP/2	Development of Flood Forecasting Model	Forecast and early warnign system	2.00	
WATER/KP/4	Increasing the water use efficiency in irrigation projects. Water audit, Benchmarking, monitoring & pricing (pilot study)	Increasing the water use efficiency in irrigation projects through Comand Area Development(CADA) (45000 Ha)	20.00	0.01
		Additional Activities, lining of canals in Major & Medium irrigation Projects (Under CLSRP) (11 nos)		
		Lining of Canals in Minor irrigation Projects (Under CLSRP)(34 nos)		
WATER/KP/5	Constructing and protecting water harvesting structures	For enhancement of in-stream storage through construction of check dams(3252) nos	470.00	447.00
		Additional Activities, Creation of additional .storage through renovations of tanks under minor irrigation (under RRR schemes) (1295 nos)		116.20
		"Renovation of MI tanks under Odisha Community Tank Management Projects (OCTMP) (324 nos)"		53.22
WATER/KP/6	Improvement of drainage system	Tomitigatedrainagecongestion, reclamation of cultivable land & reuse of drainage water for irrigation	200.00	286.39
WATER/KP/7	River health monitoring	Ecosystem and environmental flow demand studies	2.00	

KP Code	Title of Project	Sub project if any	Budget for the project (for entire period) in INR Crore	Budget provison (2012-13) - Crore
WATER/KP/8	Raising awareness with Pani Panchayat through farmers' training programme	Implementing IWRM concept in the basin through participatory management. Conservation of water resources through optimal use of water. Engagement of NGO's for raising awareness (80/4000-nos/ persons)	5.00	0.75
WATER/KP/9	Integrated water resource management	Implementing IWRM concept in the basin through participatory management. Conservation of water resources through optimal use of water. Engagement of NGO's for raising awareness (80/4000-nos/ persons)	10.00	
		TOTAL	**724.00**	**908.27**

Adaptation	291.85
Mitigation	616.42
Both	0.00
Total	**908.27**

Capacity Building	0.75
Investment	907.52
Pilot/Demo	0.00
Policy Action	0.00
Pre-Investment	0.00
Research Study	0.00
Total	**908.27**

List of Nodal Officers of Climate Change Action Plan

SL. NO.	DEPARTMENTS/ AGENCIES	NODAL OFFICERS FOR CCAP	CONTACT NO.	DESIGNATION
1	Agriculture Dept	Mr. Basanta Kumar Sar	Mob :9437728514 Offc. 2323053	Agriculturist Of Agriculture Dept.
2	F & ARD	Mr. Dhananjay Hembram (OAS)	0674-2351534 Mob: 9437147811	Addl. Secretary To Govt.
3	H & FW	Mr. Sarat Kumar Mishra	0674-2322414	Under Secretary
4	Water Resources	Chief Engineer OWPO of WR Dept. Mr. Abhaya Kumar Mohanty	....	Chief Engineer OWPO Of WR Dept.
5	Commerce & Transport Department	Mr. Kailash Chandra Sahoo	0674-2322202	Joint Secretary
6	Energy	Mr. Sangramjit Nayak	.....	Addl. Secretary (Energy Conservation Cell)
7	H & UD	Mr. Sisir Rath	....	Spl. Secretary
8	Steel And Mines	Mr. Sukhadev Das	0674-2393316	Addl. Secretary
9	Office of The Principal Chief Conservator of Forests, Aranya Bhawan, Bhubaneswar	Conservator Of Forests (Afforestation)		Conservator of Forests (Afforestation)
10	OMFED.	Mr. P.G. Dora	9439644333	OSD (Mis,Qms & CSS) Of Corporate Office BBSR

11	Directorate of State Institute of Health & Family Welfare	Mr. Kailasha Chandra Dash		Addl. Director
12	Orissa Water Supply & Sewerage Board	Project Engineer (TC)	….	Project Engineer (TC)
13	Directorate Of Public Health Odisha	Pramila Baral	9439994866	Dy. Director
14	State Pollution Control Board	Mr. N.R.Sahoo	…..	Senior Environmental Engineer
15	Odisha Forest Development Corporation Ltd.	Manager (Plantation) OFDC Ltd. Corporae Office		Manager (Plantation) OFDC Ltd. Corporae Office
16	Odisha Hydro Power Corporation Ltd.	Mr. K.S. Biswal,	….	Manager (Pr)
17	Horticulture (Hq.)	Mr. D.P. Sadangi	….	Deputy Director Of Horticulture
18	Odisha Space Application Centre	Dr. N.D.Mohanty	….	Scientist Of ORSAC
19	Chilika Development Authority		….	Additional Chief Executive, CDA
20	Office of The Chief Engineer, National Highways, Odisha, Unit-4, Sachivalaya Marg, Bhubaneswar	Mr. Minaketan Parida	….	Assistant Executive Engineer
21	Odisha State Road Transport Corporation: Bhubaneswar	Mr. Lala Ashok Kumar Ray	0674-2530846 (Office)	Dy. General Manager (Tech), OSRTC, Bhubaneswar
22	Office of The Chief Engineer Minor Irrigation, Odisha, Bhubaneswar	Mr. Laxmikanta Tripathy		Assistant Executive Engineer
23	Office of the Principal CCF (WILDLIFE)	Wildlife Conservator Officer		Wildlife Conservator Officer

LIST OF IMPLEMENTING AGENCIES:

1. H & UD Department, Odisha, Bhubaneswar.
2. Revenue & Disaster Management Department, Odisha, Bhubaneswar.
3. Energy Department, Odisha, Bhubaneswar.
4. Water Resources Department, Odisha, Bhubaneswar.
5. Health & Family Welfare Department, Odisha, Bhubaneswar
6. Industries Department, Odisha, Bhubaneswar.
7. Fisheries & ARD Department, Odisha, Bhubaneswar
8. Agriculture Department, Odisha, Bhubaneswar
9. Works Department, Odisha, Bhubaneswar.
10. Steel and Mines Department, Odisha, Bhubaneswar
11. Commerce & Transport Department Odisha, Bhubaneswar
12. The Director, Health Services, Odisha, Bhubaneswar.
13. The Director, Ports & IWT, Odisha.
14. The Managing Director, OSRTC, Bhubaneswar.
15. The Member Secretary, Odisha Water Supply & Sewerage Board. Bhubaneswar.
16. The Director, WALMI, Cuttack.
17. The Chief Engineer, PHED, Housing & Urban Dev. Department.
18. The Director, Veterinary Services, Odisha, Bhubaneswar.
19. The Director, Fisheries, Odisha, Bhubaneswar
20. The Director, State Institute of Health. Odisha, Bhubaneswar
21. The Chief Engineer, National Highway. Odisha
22. The PCCF, Odisha. Bhubaneswar
23. The PCCF (WL), Odisha., Bhubaneswar
24. The Transport Commissioner, Odisha, Cuttack
25. The Director, Watershed Development Mission, Bhubaneswar
26. The Managing Director, O.S.D.M.A., Bhubaneswar
27. The Chief Executive, ORSAC. Bhubaneswar
28. The Managing Director, OFDC, Bhubaneswar
29. The Director, Mines, Odisha., Bhubaneswar
30. The Member Secretary, State Pollution Control Board, Odisha, Bhubaneswar
31. The Chief Executive, Chilika Development Authority
32. The Director, Municipal Administration.H & UD department
33. The Director, Horticulture. Odisha

34. The Joint Secretary, Energy Department (Energy Conservation Cell)

35. The Chief Executive, OREDA.

36. The EIC, P& D, WR Department.

37. The Director, Hydrology, WR Department.

38. The Chief Engineer & BM, LMB, WR Department

39. The Chief Engineer, MI.

40. The Chief Engineer, Drainage. Cuttack

41. The Director, Odisha Hydropower Corporation. Bhubaneswar

42. The Chief Engineer, Works Department.

Annexure C

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