



# Review of Odisha State Adaptation Policies, Mahanadi Delta WT6.1.2



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## **1. INTRODUCTION**

### **a. Aim of the paper**

Odisha, being one of the maritime states on the east coast of India, witnessed several historical devastating cyclones and other tropical storm surges, and with the process of climate change, it is considered one of the most vulnerable areas in the region. The Mahanadi Delta region in Odisha faces serious threats and challenges to safeguard land based resources and coastal resources supporting millions of coastal population in terms of climate change and related impacts viz. intense tropical cyclones, coastal erosion, land submergence, coastal inundation. The present situation demands attention and early actions for resilience to the impact of climate change through effective policy/plan changes.

The present document summarises the adaptation activities mentioned in the reviewed state government policies/plans; and provides suggestions to the government regarding future actions to build resilience and help combat climate change impacts. This policy/plan review focuses on accumulating integrated efforts towards the objectives of climate change adaptation in the related sectoral policies/plans viz. Coastal Management, Agriculture, Energy, Construction, Disaster Risk Reduction, Forestry; this will further help build up an array of government supported adaptation options, better resilience structure and effective adaptive capacity of the coastal population in the delta.

This review of government policies/plans for the state of Odisha, addresses the scope of climate change adaptation options and its related sectors for Mahanadi Delta. Further, this document provides evidence of the existing government initiatives towards reduction of climate change impacts and the adoption of specific alternatives, in the form of climate change adaptation options required through a new policy/plan or a corrigendum of existing policies/plans.

### **b. Discussion of the relevance of climate change adaptation policy in the delta**

The present review analyses the possible role of Odisha state government's plans/policies for climate change and related sectors with a view to strengthen the state's adaptive capacity to the changing climate stress. The entire analysis is based and/or restricted to the policy/plan documents available in the public domain viz. government websites, portals etc.. Climate change adaptation is new in the policy context both at the state and national level in India, which shows the progress of policy instruments dealing with climate change during the last decade. It is interesting to observe that promptness of the adaptation issues varies sector wise.

The Odisha state agricultural policy seems to have a wide range of cross sectoral adaptation options, viz. across the sectors of infrastructure and transport development, capacity building, self help groups and Micro credit. Another interesting observation relates to the implementation of these policies/plans, that some of the phases are within the control of Ministry/Department like approval and certification ; whereas, the implementation of policies/plans at the ground level are beyond the control of the Ministry/Department like irrigation and infrastructure programmes in Agricultural sector. Hence, these differences of authority, pertaining to the inconsistency of the governmental structure/mode of operation might be termed an institutional issue. The study area of the Mahanadi Delta relates to the coastal zone (one of the four biogeographical regions of Odisha) and encompasses a wide range of climate change and related sectoral policies/plans, it often shows weak interlinkages and inappropriate execution of the policies/plans. This has posed a major constraint for the uptake of any adaptation activities in the State of Odisha.

Climate change adaptation oriented policies/plans might help in creation of adaptation strategies to deal with climate change issues in different sectors viz. agriculture, water resource management and embankment maintenance and retrofitting and initiate appropriate adaptation activities. Specific policies/plans can also assess the climate risk through climate driven approaches and make a convergence with the developmental activities for sustainable investment, better resilience and effective adaptive capacity for the coastal population in the delta.

### **c. Discussion on why including gender in policy is important**

The concept of gender in the reviewed policies/plans is a cross cutting issue, which is also a socio-cultural variable like other cross cutting socio-cultural variables like race, class, age and ethnic group. Gender includes men and women and persons with other gender identities and their various interrelationships. It is scientifically evident that changes in the climate variability have visible impacts on agricultural production, food security, energy accessibility, forest degradation, soil erosion and sea level rise etc. Gender equality has a vital role to play in meeting the challenges of food security and to overcome poverty trap. It is often observed that there are differences of perception and approach of men and women<sup>1</sup> towards awareness of the

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<sup>1</sup> While we agree that there is no longer a binary understanding of gender, this review talks mostly in terms of men and women. For the purposes of this review, the term 'women' may be extended to mean cis women and all marginalized genders.

events, disaster response and adaptive capacity, anticipating any form of climatic stress. Hence, the above situation also demands focussing on gender equality and equity in every aspect of climate change and related policies/plans, so that they are efficient and effective to combat future climate risks at vulnerable locations. It is also an important variable, not only for better economic growth but also for better quality of life of individual men and women irrespective of society, culture and geographical location. Adaptation in agriculture or agricultural growth will be enriched, if men and women work together and participate in agricultural production as equal economic actors. It has been seen that there is an increase in agricultural output if women have equal accessibility in agricultural production. Women-operated agricultural farms have 20-30 percent higher production rate than the men operated farms with the same condition (FAO 2011). Women's involvement in decision making committees at local, regional and district level like natural resource committee will improve the natural resource management and conservation (IFAD 2012). In India, women's participation in decision making is encouraged and supported by the 73<sup>rd</sup> and 74<sup>th</sup> amendments to the Constitution. Capital intensive technologies like solar or energy efficient cook stoves and woodlot plantation for fuel wood will reduce women's workloads, since most household tasks worldwide are still performed by women, and also reduce pressure on forests.

#### **d. Outline of the paper**

The present paper has been developed through the inventory of existing policies relating to climate change adaptation, resource management and developmental activities. The paper starts with a review of climate policies/plans and the importance of climate policy/plan in the delta. The paper also discusses the importance of gender in climate policy/plan. Recognizing a gender dimension in policy can influence the implementation of policy/plan activities and contribute to gender equality. The present review document based on the policy inventory is mostly an analysis of existing policies on adaptation activities relevant for Mahanadi Delta, which has been implemented by the state government of Odisha. In the last section, the paper comments on wider adaptation activities and opportunities for policy/plan development.

## 2.0 Methodology

### a. Method applied

Data has been collected from policy documents and plans in order to identify government adaptation responses to climate change, variability or extremes in the delta. Using the suggested template, a policy inventory has been compiled. In the context of DECCMA, policy is a general guidance for addressing public concerns and plan is an outline of how to achieve policy goals in practice. In this review, both policies and plans have been included. In Mahanadi Delta the appropriate government strategies and other documents are also included. Four steps have been taken in this policy inventory process. These are

- i. Identify climate change adaptation-relevant policies
- ii. Create a database of climate change adaptation relevant policies
- iii. Assess the extent of climate change adaptation in the policies through content analysis. This has been carried out considering 11 keywords/ adaptation terms i.e. Adapt, Cope, Thrive, Transform, Adjust, Risk, Vulnerability or vulnerable, Resilience or resilient, Robust, Bounce back and Capacity.
- iv. Assess the evidence of adaptation in the policy documents through thematic analysis. This analysis has been carried out with the adaptation options in the existing policies through identification of key adaptation terms.

### **3. Data Analysis**

#### **a. Discussion of Policy Documents**

A total of 21 policies/plans have been reviewed for Mahanadi Delta under state government policies/plans of Odisha. Seven plan documents have been reviewed, namely, Odisha Climate Change Action Plan (OCCAP), State Disaster Management Plan (SDMP), Disaster Management Plan - Department of Women and Child Development, DMP (Draft) - Department of Health and Family Welfare, Annual Action Plan – Panchayati Raj Department, Perspective and Strategic Plan for Watershed Development Projects, Integrated Coastal Zone Management of Orissa coast - Gopalpur to Chilika and Paradeep to Dhamara. The nine policy documents reviewed are State Disaster Management Policy, State Agricultural Policy, State Reservoir Fishery Policy, State Water Policy, Odisha Urban Working Policy, Odisha Resettlement and Rehabilitation Policy, Odisha Solar Policy, Policy Guidelines on Power Generation from Non-Conventional Energy Sources and Odisha State Policy for Girls and Women. Apart from the plan and policy documents, five documents on different rules and acts have been found; namely, Joint Forest Management Resolution, Scheme for Affordable Urban Housing in Odisha, Poverty Alleviation - Poverty in Odisha, Gender Disparity and The Orissa Development Authorities Act.

The review list of Odisha is formulated during the period of 1982-2015. These policies and plans cover a varied range of sectors like Climate Change and its Impacts, Agriculture, Water, Fisheries (Inland & Marine), Disaster Management, Forestry, Integrated Coastal Zone Management, Land-use, Wetlands and Water Bodies, Renewable Energy, Rural Employment Generation and Women Empowerment. Of the total 21 policies and plans analysed, 19 contain references to climate adaptation, for which, these were further analysed to understand and record the state government's concern and approach towards addressing climate change impact and related issues. See Table-1 below



**Table 1: Showing the total list of documents searched under  
State Policies/Plans/Rules, Acts & Reports**

Sl. No.	Total Searched List of Documents	Total number of Entries (22)	Names of the Documents
1.	State Government Plans	07	1. Odisha Climate Change Action Plan (OCCAP) 2. State Disaster Management Plan (SDMP) 3. Disaster Management Plan - Department of Women and Child Development 4. DMP (Draft) - Department of Health and Family Welfare 5. Annual Action Plan – Panchayati Raj Department 6. Perspective and Strategic Plan for Watershed Development Projects 7. Integrated Coastal Zone Management of Orissa coast - Gopalpur to Chilika and Paradeep to Dhamara
8.	State Government Policies	09	1. State Disaster Management Policy 2. State Agricultural Policy 3. State Reservoir Fishery Policy 4. State Water Policy 5. Odisha Urban Working Policy 6. Odisha Resettlement and Rehabilitation Policy 7. Odisha Solar Policy 8. Policy Guidelines on Power Generation from Non-Conventional Energy Sources 9. Odisha State Policy for Girls and Women
10.	State Government Rules, Acts and Reports	05	1. Joint Forest Management Resolution 2. Scheme for Affordable Urban Housing in Odisha 3. Poverty Alleviation - Poverty in Odisha 4. Gender Disparity 5. The Orissa Development Authorities Act

#### **b. Content Analysis**

Nineteen State Government Policy/Plan documents contain at least one or more related keywords (viz. Odisha Climate Change Action Plan, State Disaster Management Plan, Disaster

Management Plan - Department of Women and Child Development, Disaster Management Plan (DMP) (Draft)- Department of Health and Family Welfare, Annual Action Plan – Panchayati Raj Department, Perspective and Strategic Plan for Watershed Development Projects, Integrated Coastal Zone Management of Orissa coast - Gopalpur to Chilika and Paradeep to Dhamara, State Disaster Management Policy, State Agricultural Policy, State Water Policy, Odisha Urban Working Policy, Odisha Resettlement and Rehabilitation Policy, Odisha Solar Policy, Policy Guidelines on Power Generation from Non-Conventional Energy Sources, Odisha State Policy for Girls and Women, Joint Forest Management Resolution, Scheme for Affordable Urban Housing in Odisha, Poverty Alleviation - Poverty in Odisha, Gender Disparity). Among these 19 documents, State Disaster Management Plan (2013) shows highest variance with use of seven different key terms (viz. Adapt-1, Cope-14, Thrive-1, Risk-72, Vulnerable/Vulnerability-143, Resilience or resilient-2, Robust- 1, and Capacity-46) which is followed by Odisha Climate Change Action Plan (2010) (viz. Adapt- 56, Cope-10, Risk-9, Vulnerability/Vulnerable-50, Resilience or resilient-13), Annual Action Plan (2012-13) and Disaster Management Plan (2013-14) have five keywords. The documents which have contained at least one keyword are: Odisha Urban Parking Policy (2013), Odisha Solar Policy (2013), Policy Guidelines on Power Generation from Non-Conventional Energy Sources (2005), and Gender Disparity Odisha (2010) See Table -2a and 2b below

**Table 2a: Showing the highest variances of the key terms in the documents searched under State Policies/Plans/Rules, Acts & Reports**

Documents Key Terms	State Disaster Management Plan (2013)	OCCAP (2010)	Annual Action Plan (2012-13)	Disaster Management Plan (2013-14)
Adapt	01	56	-	-
Cope	14	10	02	02
Thrive	01	-	-	-
Risk	72	09	04	08
Vulnerable/Vulnerability	143	50	28	17
Resilience/Resilient	02	13	-	03
Robust	01	-	01	-
Capacity	46	-	42	09

**Table 2b: Showing the lowest variances of the key terms in the documents searched under State Policies/Plans/Rules, Acts & Reports**

Documents Key Terms	Odisha Urban Parking Policy (2013)	Odisha Solar Policy (2013)	Power Generation from Non-Conventional Energy Sources (2005)	Gender Disparity Odisha (2010)
Transform	-	-	-	01
Capacity	01	15	05	-

### c. Key Themes Emerging

The detailed review of state government's plan and policy documents shows a wide range of adaptation options emerging as key themes, under the sectors of agriculture, farming systems, disaster response and relief, capacity building and infrastructure.

The previous section discussed how different key themes relating climate change adaptation have emerged across the sectors. In the sectors of Agriculture and Fishery, for example, it is observed that a variety of adaptation options have emerged in State Agriculture Policy (2013) such as integrated farming systems (combination of agriculture and aquaculture), compatible agricultural strategies (plantation on berms of agriculture and aquaculture fields, multi tier cropping system), land levelling, automated irrigation operation, Systemic Rice Intensification (SRI) method of farming, thermal resistant crop, alternative cropping pattern, crop improvement and crop insurance scheme (refer Table - 3 in the annexure).

The state has shown interest and promptness in combating climatic disorders through the help of several disaster plans/policies. The State Disaster Management Policy (SDMP) (2005) and the subsequent Disaster Management Plan of 2013, emphasised infrastructure development. These include strengthening of roads, bridges, embankments, retrofication and maintenance of dams, canals and drains, construction of new public and community buildings, power transmission and distribution networks . Priority has been given to the development of shelters with water supply, toilet, water storage and kitchen services. Further, the necessity of raising the tube well platforms above the normal level, in the flood prone areas has been considered (SDMP, 2013). Additionally, proper maintenance of the embankments at regular intervals, along with effective construction of the embankment in the landward side, keeping top level 7.4 m above Mean Sea Level (MSL) with top width of 5.0 m filling with compacted earth fill, will be on the priority list (Odisha ICZMP).

Orissa Climate Change Action Plan (OCCAP), (2010) has also mentioned the following actions in respect of delta infrastructural adaptation options: i) constructing flood shelters at vulnerable locations, ii) need of assessment and constructing multi-purpose cyclone shelters, iii) developing a techno-legal regime for construction of disaster resilient housing and public infrastructure. The features advised in OCCAP, are aimed at developing resilience to extreme weather conditions and prompt response to threatening disaster situations/events. Additionally, Cyclone Shelters are planned to be equipped with sanitation and drinking water facility as

encouraged by OCCAP, SDMP and other sector wise disaster management plans, where OCCAP has given special emphasis on disaster resilient housing and public infrastructure (refer Table - 3 in the annexure).

Capacity building options are mentioned several times in different plan and policy documents. OCCAP (2010) has mentioned stakeholder consultations for capacity building at Bhubaneswar, Berhampur, Angul and Balasore district where key stakeholders as well as primary stakeholders participated. Integrating climate change considerations in the State Health Policy include technical and capacity building support to Community-Based Organisations (CBOs), actions such as community resilience and disaster preparedness, strengthening psychological aid to victims, strengthening surveillance including traditional knowledge and cultural norms. So capacity building has been encouraged by OCCAP, State Health Policy where OCCAP has given special emphasises on capacity building support to Community-Based Organisations (CBOs).

SDMP (2005) follows a multi-hazard approach to disaster management and involvement of all stakeholders, irrespective of their direct and/or indirect rate of influence and/or interest, and they are subsequently, assigned specific roles. The major points highlighted in SDMP document are as follows:

- view people as valuable partners and strengthen community-based coping mechanisms for dealing with disasters
- decentralise management of disasters at the block, gram panchayat or municipality levels
- strengthen their institutional and functional capacities to be effective as the first responders to disaster events
- community based disaster management plans and Mock Drills should be undertaken to ensure better preparedness
- organise training and orientation need for elected people's representatives, Government officials, NGOs, community leaders, teachers, students and disaster response task forces
- Strengthen existing community buildings

Increasing and protecting existing mangrove cover along with the coast and developing mangrove seed banks options promoted by Odisha Climate Change Action Plan and Disaster Management Policy help to reduce the impact of cyclones and storms.

#### d. Gender dimensions

Researchers and policy makers are trying to understand how a gendered approach can be developed /incorporated in combating and/or adapting to climate change. To get the successful adaptation activity the adaptation policies and measures must be gender sensitive. (Roehr U, 2007). In Odisha, out of 21 identified State policies/plans, only seven policies/plans (State Disaster Management Policy, 2005, State Disaster Management Plan, 2013, Disaster Management Plan 2013-2014, Disaster Management Plan (Draft), 2014, Joint Forest Management Resolution, 2008, Integrated Coastal Zone Management of Orissa coast, Odisha State Policy for Girls and Women, 2014) have discussed gender dimensions. Out of seven policies/ plans, four are on disaster management, one specifically on girls and women and the other two are on forest and coastal zone management plan. See Table 3 below.

**Table 3: Showing the Odisha State Policies/Plans addressing/considering Gender Issues**

Sl. No.	Key Issue Policy/Plan Documents	Gendered Approach
1.	Odisha Climate Change Action Plan	
2.	State Disaster Management Policy (2005)	+
3.	State Disaster Management Plan (2013)	+
4.	Disaster Management Plan (2013-14)	+
5.	Disaster Management Plan (Draft)	+
6.	State Agriculture Policy	
7.	State Reservoir Fishery Policy	
8.	Joint Forest Management Resolution (2008)	+
9.	State Water Policy	
10.	Perspective and Strategic Plan for Watershed Development Projects Odisha	
11.	Integrated Coastal Zone Management of Orissa coast - Gopalpur to Chilika and Paradeep to Dhamara	+
12.	The Orissa Development Authorities Act	
13.	Odisha Urban Parking Policy	
14.	Scheme for Affordable Urban Housing in Odisha	
15.	Orissa Resettlement and Rehabilitation Policy	

16.	Odisha Solar Policy	
17.	Policy Guidelines on Power Generation from Non-Conventional Energy Sources	
18.	Annual Action Plan, Odisha	
19.	Chapter 8. Poverty Alleviation (Poverty in Odisha)	
20.	Gender Disparity Odisha	
21.	Odisha State Policy for Girls and Women	+

The key focus areas of the Odisha State Policy for Girls and Women (2014) are survival, health and nutrition; education; livelihood (women in formal sector and informal sector); asset ownership; decision making, participation and political representation; safety, security and protection, and girls and women with special needs. The policies of sectors like agriculture, water, energy have not incorporated any gender dimension but these sectors are highly associated with climate change impacts.

Decrease in agricultural production will put additional burden on women because they are tasked with providing food for the family. Decrease of firewood in the local area will also increase the work burden of women as they have to spend more time on collecting firewood. Again, burning biomass will create indoor air pollution, which causes respiratory diseases. Water scarcity also creates additional burden on women because they are responsible for collecting and storing of water for drinking and household needs. So the gender dimensions like decision making power, institutional power, cultural norms, and gender division of labour need to be addressed.

## **4. Discussion**

### **a. Comparison of findings with wider literature on climate change adaptation**

According to the wider literature on climate change adaptation scoping or pilot study, stakeholder participation is required during the designing and planning of adaptation activity but the plan document reveals that very few plans have considered stakeholder involvement. The Adaptation Policy Framework (AFP) developed by UNDP was implementable in spheres of urban flooding and droughts in India but the policy framework faced problems to execute the plans at micro level and identify the gaps in stakeholders' participation in the project implementation (Mirza, Burton 2005).

Low per capita income, lack of access to social capital and administrative limits are the major constraints for adaptation among the coastal population. Mainstreaming adaptation in development planning might reduce the climate vulnerability. India is the first nation in South Asia who has adopted first National water policy and this has been revised in the year 2002. The revised document (National Water Policy 2002) has discussed many times about the conservation of water, water use efficiency and importance of watershed development but has not been discussed about the climate change and adaptation (Mirza M, 2007).

In the literature review of climate change adaptation activity, awareness programmes and capacity building are important activities to understand the impact of climate change and vulnerability assessment. However, not many such initiatives have been taken while formulating or implementing different policies/plans. In the adaptation activity review it has been seen that disaster risk reduction was the motivation for adaptation planning and implementation activity. The policy review showed that there is a limited scope for an integrated and holistic approach of adaptation planning. The results from the adaptation inventory demonstrate that there is a strong focus on Monitoring and Evaluation of past and on-going adaptation activities, whereas, the present policy review shows the importance of monitoring and evaluation strategy is rare. The adaptation activity review also shows that there are very few articles which focus on migration as adaptation activity but in the policy review, migration has not been taken as a successful adaptation strategy.

### **b. What is missing from the country context in terms of policy and content?**

In Odisha, the policies/plans are sector specific and there is a lack of convergence or linkage with other related policies. The agricultural policies have not mentioned the requirements and

challenges of the poor and marginal farmers and are also not concerned about the different agro-climatic zones in the state. The policies have not reflected the criticality of climate change in the agricultural sector. The forestry policies have barely emphasised the reduction of forest diversion or deforestation, but have emphasised plantation activities. In the energy sector, the policies are focused on end use energy efficiency rather than all round energy efficiency. Similarly, in the transport sector less attention has been paid to urban transport planning and demand side management. Likewise, in the water sector, there is very little integration of climate change and developmental activities.

Further, there seems to be a lack of demand side management, but through increasing the efficient use of the end user and proper waste management the scarce resources can be conserved. It will be worth mentioning at this juncture, that policy integration and convergence with different line departments seems to be missing. Lack of budget allocation is another obstacle for integrated planning and effective implementation of the policies/plans.

### **c. Opportunities for policy development**

Policy development is one of the tools for integrating economic, social, environmental and governance dimensions of sustainable development at all stages of policy making (Knoll, A 2014). Academic research has often played an important role in the country's policy/plan development. In terms of economics, climate change is an externality. Certain activities undertaken by an individual/group of individuals cause greenhouse gas emission but the cost of those activities is borne by the rest of the world. The externality comes from the individual activity and the externality causes inefficiency. Hence, to reduce the impacts of climate change or to increase efficiency, adaptation or mitigation activity is required. Adaptation activity may be one of those aspects, which has a positive impact on the other. For example, in the Mahanadi Delta, salt water intrusion due to sea level rise has an impact on agricultural production, but seed bank of salt tolerant paddy will reduce the impact on agricultural sector. This will also increase food security and improve nutritional level of the community and thus, have a positive impact on public health. So the convergence of policies, especially developmental policies, is required to reduce the negative impact of climate change.

To reduce the negative impact of climate change, there are only two options 1) enhancement of community resilience, 2) expansion of the range of adaptation strategies. In the Mahanadi delta there is a prospect of specific climate policy which will focus on the State development strategies with respect to specific geographic areas for state specific major sectors which are



vital for the State's economy. The sectors may be Coastal Zone Management, Agriculture, Water, Disaster risk reduction and Forestry and Ecosystem. Integrated assessment and consultation will help in finding links between the sectors and will identify the scale of convergence.

## 5.0 Conclusions

A total of 21 policies/plans/reports have been reviewed for the State of Odisha and those documents were selected with respect to the link with climate change and related sectors. Seventy major adaptation options are identified in 8 major sectors and one cross cutting issue (see Annexure 3). Very little convergence and integration in the environmental sectors and cross cutting sector has been found, but a successful climate policy requires integration. At the local level, there are a number of institutional, analytical, and operational issues, which must be resolved with involvement of the community. The policy makers can use academic research for policy making and developing feasible implementation plans.

Very few policies have focussed on gender. A gender perspective must be integrated into policy making and must be emphasised in stakeholder analysis, livelihood assessment and developmental planning.

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### Annexure 1: List of State Policies for Odisha to be included in the Policy Review

Sl. No.	Name	Department	Date	Period	Source
1.	Odisha Climate Change Action Plan (OCCAP)	Forest & Environment Department. Government of Odisha	2010	2010-2015	Electronic <a href="http://orissa.gov.in/portal/occap.pdf">http://orissa.gov.in/portal/occap.pdf</a>
2.	State Disaster Management Policy	Revenue Department Government of Odisha	4 <sup>th</sup> March, 2005	Not Specified	Electronic <a href="http://www.osdma.org/Download/DM%20Policy.pdf">http://www.osdma.org/Download/DM%20Policy.pdf</a>
3.	State Disaster Management Plan	Odisha State Disaster Management Authority. Government of Odisha	2013	Not Specified	Electronic <a href="http://www.osdma.org/Download/State_Disaster_ManagementPlan_Aug2013.pdf">http://www.osdma.org/Download/State_Disaster_ManagementPlan_Aug2013.pdf</a>
4.	Disaster Management Plan	Department of Women and Child Development. Government of Odisha	2013-2014	Not Specified	Electronic <a href="http://wcdodisha.gov.in/node/242">http://wcdodisha.gov.in/node/242</a>
5.	Disaster Management Plan (Draft)	Department of Health and Family Welfare Government of Odisha	2014	Not Specified	Electronic <a href="http://203.193.146.66/hfw/PDF/Disaster_Management.pdf">http://203.193.146.66/hfw/PDF/Disaster_Management.pdf</a>
6.	State Agriculture Policy	Agricultural Department. Government of Odisha	2013	Not Specified	Electronic <a href="http://www.apicol.co.in/State%20Agriculture%20Policy%20%202013.pdf">http://www.apicol.co.in/State%20Agriculture%20Policy%20%202013.pdf</a>
7.	State Reservoir Fishery Policy	Fisheries and Animal Resource Development Department. Government of Odisha	2004	Not Specified	Electronic <a href="http://orissa.gov.in/e-magazine/orissaannualreference/ORA-2004/pdf/state_reservoir_fishery_policy.pdf">http://orissa.gov.in/e-magazine/orissaannualreference/ORA-2004/pdf/state_reservoir_fishery_policy.pdf</a>
8.	Joint Forest Management Resolution	Forest & Environment Department. Government of Odisha	2008	Not Specified	Electronic <a href="http://www.odisha.gov.in/forest_environment/Forest_resolution/pdf/17454_22.10.08.pdf">http://www.odisha.gov.in/forest_environment/Forest_resolution/pdf/17454_22.10.08.pdf</a>
9.	State Water Policy	Department of Water Resources. Government of Odisha	2007	Not Specified	Electronic <a href="http://www.dowr.orissa.gov.in/SWP2007/SWP%202007.pdf">http://www.dowr.orissa.gov.in/SWP2007/SWP%202007.pdf</a>
10.	Perspective and Strategic Plan for Watershed Development Projects Odisha	Orissa Watershed Development Mission. Agriculture Department. Government of Odisha	2010	2010-2025	Electronic <a href="http://www.orissawatershed.org/admin/uploadguide/guide_119.pdf">http://www.orissawatershed.org/admin/uploadguide/guide_119.pdf</a>
11.	Integrated Coastal Zone Management of Orissa coast - Gopalpur to Chilika and Paradeep to Dhamara	State Project Report. Government of Odisha			Electronic <a href="http://iczm.podisha.org/project_report/Project%20Report.pdf">http://iczm.podisha.org/project_report/Project%20Report.pdf</a>
12.	The Orissa Development Authorities Act	Housing & Urban Development Department. Government of Orissa	1982	Not Specified	Electronic

					<a href="http://bdabbsr.in/BuildingPlanning/ODAAct.pdf">http://bdabbsr.in/BuildingPlanning/ODAAct.pdf</a>
13.	Odisha Urban Parking Policy	Housing & Urban Development Department. Government of Odisha	2013	Not Specified	Electronic <a href="http://www.urbanodisha.gov.in/(S(mmsysc45j1g52d55er0ffn45))/pdf/gazettes_notifications/Odisha_Urban_Parking_Policy.pdf">http://www.urbanodisha.gov.in/(S(mmsysc45j1g52d55er0ffn45))/pdf/gazettes_notifications/Odisha_Urban_Parking_Policy.pdf</a>
14.	Scheme for Affordable Urban Housing in Odisha	Housing and Urban Development Department, Government of Odisha	2012	Not Specified	Electronic <a href="http://www.ouidf.in/pdf/Scheme_for_Affordable_Urban.pdf">http://www.ouidf.in/pdf/Scheme_for_Affordable_Urban.pdf</a>
15.	Orissa Resettlement and Rehabilitation Policy	Department of Rural Development, Government of Odisha	2006	Not Specified	Electronic <a href="http://orissa.gov.in/e-magazine/orissaannualreference/OR-Annual-2009/pdf/313-322.pdf">http://orissa.gov.in/e-magazine/orissaannualreference/OR-Annual-2009/pdf/313-322.pdf</a>
16.	Odisha Solar Policy	Science and Technology Department. Government of Odisha	2013	Not Specified	Electronic <a href="http://www.orissa.gov.in/sciencetechnology/Odisha_Solar_Policy.pdf">http://www.orissa.gov.in/sciencetechnology/Odisha_Solar_Policy.pdf</a>
17.	Policy Guidelines on Power Generation from Non-Conventional Energy Sources	Science and Technology Department. Government of Odisha	2005	Not Specified	Electronic <a href="http://oredaodisha.com/pdf/policy-guidelines.pdf">http://oredaodisha.com/pdf/policy-guidelines.pdf</a>
18.	Annual Action Plan, Odisha	Panchayati Raj Department. Government of Odisha	2012-2013	Not Specified	Electronic <a href="http://aajeevika.gov.in/AAP/AAP-Odisha.pdf">http://aajeevika.gov.in/AAP/AAP-Odisha.pdf</a>
19.	Chapter 8. Poverty Alleviation (Poverty in Odisha)	Planning Commission	2005	Not Specified	Electronic <a href="http://www.odisha.gov.in/pc/Download/eco2005/eco-8.pdf">http://www.odisha.gov.in/pc/Download/eco2005/eco-8.pdf</a>
20.	Gender Disparity Odisha	Directorate of Economics and Statistics, Odisha.	2010	Not Specified	Electronic <a href="http://desorissa.nic.in/des-data/latest_publications/gender%20statistics-2010.pdf">http://desorissa.nic.in/des-data/latest_publications/gender%20statistics-2010.pdf</a>
21.	Odisha State Policy for Girls and Women	Department of Women & Child Development. Government of Odisha	2014	Not Specified	Electronic <a href="http://wcdodisha.gov.in/sites/default/files/pdf/Odisha%20State%20Policy%20for%20Girls%20and%20Women%2C%202014%20%28English%29.pdf">http://wcdodisha.gov.in/sites/default/files/pdf/Odisha%20State%20Policy%20for%20Girls%20and%20Women%2C%202014%20%28English%29.pdf</a>

## Annexure 2: Count of basic terms in State Policy/Plan documents in Odisha

<b>Policy Documents</b>	OCCAP, 2010	State Disaster Management Policy, 2005	State Disaster Management Plan, 2013	Disaster Management Plan 2013-2014	Disaster Management Plan (Draft), 2014	State Agriculture Policy, 2013	State Reservoir Fishery Policy, 2004	Joint Forest Management Resolution, 2008	State Water Policy, 2007	Perspective and Strategic Plan for Watershed Development Projects Odisha, 2010	Integrated Coastal Zone Management of Orissa coast
<b>Key Issues</b>											
Adapt	56	0	1	0	0	0	0	0	0	0	0
Cope	10	0	12	2	1	0	0	0	0	1	1
Thrive	0	0	1	0	0	0	0	0	0	0	0
Transform	0	0	0	0	0	0	0	0	0	0	0
Adjust	0	0	0	0	0	0	0	0	0	0	0
Risk	9	3	72	8	46	1	0	1	0	5	6
Vulnerability or vulnerable	50	20	143	17	16	2	0	0	0	5	15
Resilience or resilient	13	3	2	3	0	0	0	0	0	1	0
Robust	0	0	1	0	0	0	0	0	0	1	0
Bounce back	0	0	0	0	0	0	0	0	0	0	0
Capacity	0	2	46	9	9	10	-	3	3	93	17

## Annexure 2.: Count of basic terms in State Policy/Plan documents in Odisha (cont.)

<b>Policy Documents</b>	The Orissa Development Authorities Act., 1982	Odisha Urban Parking Policy, 2013	Scheme for Affordable Urban Housing in Odisha, 2012	Orissa Resettlement and Rehabilitation Policy, 2006	Odisha Solar Policy, 2013	Policy Guidelines on Power Generation from Non-Conventional Energy Sources, 2005	Annual Action Plan, Odisha, 2012-13	Chapter 8. Poverty Alleviation (Poverty in Odisha), 2005	Gender Disparity Odisha, 2010	Odisha State Policy for Girls and Women, 2014
<b>Key Issues</b>										
Adapt	0	0	0	0	0	0	0	0	0	0
Cope	0	0	0	0	0	0	2	0	0	0
Thrive	0	0	0	0	0	0	0	0	0	0
Transform	0	0	0	0	0	0	0	0	1	0
Adjust	0	0	1	0	0	0	0	0	0	0
Risk	0	0	1	0	0	0	4	0	0	0
Vulnerability or vulnerable	0	0	0	3	0	0	28	3	0	7
Resilience or resilient	0	0	0	0	0	0	0	0	0	0
Robust	0	0	0	0	0	0	1	0	0	0

Bounce back	0	0	0	0	0	0	0	0	0	0
Capacity	0	1	4	2	15	5	42	1	0	8

### Annexure 3: Adaptation policy options promoted by State Policy/Plan Documents in Odisha

Summary of Adaptation Policy Option	OCCAP, 2010	State Disaster Management Policy, 2005	State Disaster Management Plan, 2013	Disaster Management Plan 2013-2014	Disaster Management Plan (Draft), 2014	State Agriculture Policy, 2013	Joint Forest Management Resolution, 2008	State Water Policy, 2007	Perspective and Strategic Plan for Watershed Development Projects Odisha, 2010	Integrated Coastal Zone Management of Orissa coast
Seasonal Livelihood Diversification	-	-	-	-	-	-	-	-	X	-
Transport Improvements/Development	-	-	-	-	-	-	-	-	-	-
In India, there is Moratorium on GM Food Crop	-	-	-	-	-	-	-	-	-	-
Delta Infrastructure Development	X	X	X	-	-	-	-	-	-	X
Capacity Building	X	X	X	X	-	X	x	x	-	x
S H G – WomenEmp. & Micro-Insurance for Female Entrepreneurs	-	X	-	X	-	X	-	-	-	X
Funding for flood-cyclone-multipurpose shelters	-	-	-	-	-	-	-	-	-	X
Mangrove Rehabilitation and additional Mangrove Afforestation	X	X	-	-	-	-	-	-	-	X
Forestry										
Conserving Ecosystem services						X				
Carbon sequestration										
Biodiversity Conservation and Management	X					x	x			X
Preservation of green fodder						x				
Social Forestry & Farm Forestry	X									
Afforestation programme	X									
Watershed management										
Coastal and water										
Integrated coastal zone management										
Water resource management	X		X			x		X	X	
Wetland management										



Flood management			X					X		
Safe Drinking Water Supply			X		X		x	X		
Ground water Management										
Wetland management										
Reclamation of Land( saline/waterlogged/degraded)						x				
Avoidance of inadvertent evapo- transpiration										
Land-soil-water management	X									
Recycling of canal seepage water										
Water harvesting programme	X									
Coastal aquaculture Farm management	X									
Energy										
Promoting Clean development mechanism										
Enhancing Renewable energy capacity										
Energy efficiency and conservation										
Solar power implement	X									
Energy conservation building code										
Evaluation of clean 'Green' and 'intelligent' buildings										
Hydropower generations	X					x				
Wind energy generations						x				
Natural gas based power plants						x				
Renewable Energy Resources	X									
Disaster										
Developing resilience to extreme weather conditions										
Prompt response to threatening disaster or situation										
Disaster risk reduction										
Evacuation rescue and relief										
Rehabilitation and Reconstruction after disaster										
Drought management										
Response team to disaster		X	X		X					
Disaster resilience construction (shelters)			X	X	X					

Early Warning System			X	X	X	x				
Disaster insurance			X							
Agriculture, animal husbandry and Fisheries										
Integrated farming systems	X		X		X				X	
Compatible agricultural strategies land levelling										X
Genetically Modified Crops	X						x			
Automated irrigation operation										
SRI method of farming	X					x				
Thermal resistant crop	X									
Alternative cropping pattern, crop improvement	X								X	
Crop insurance scheme										
Soil Conservation and management	X									
Seed infrastructure development	X									
Integrated nutrient Management						x				
Integrated Pest Management						x				
Livestock Farming							x			
Fisheries	X		X							x
Urbanization and transport										
Waste Management	X									
Long term transport plan						x				
Networking infrastructure				X	X	x				
Health										
comprehensive primary health care services			X	X	X	x			X	X
Health programmes			X	X	X		x			
Human health and medical care		X	X		X					
Gender										
Women Empowerment,							X			X
Mother and Child Nutrition programme			X	X	X					
Institutional services for women		X	X	X	X					
General										
Self-employment programmes									X	
Adaptation in advance technology	X			X						

Climate resilient technological options.	X									
IEC initiatives			X	X						
Suitable institutional mechanism	X		X	X						
Promote adaptive research							X			
Poverty alleviation										X
Credit support mechanism facility								X		
Technology transfer										
Human resources development							x			
Rural livelihood improvement		X	X			x				
Extending Insurance coverage in general										

### Annexure 3: Adaptation policy options promoted by State Policy/Plan Documents in Odisha (cont.)

Summary of Adaptation Policy Option	Odisha Urban Parking Policy, 2013	Scheme for Affordable Urban Housing in Odisha, 2012	Orissa Resettlement and Rehabilitation Policy, 2006	Odisha Solar Policy, 2013	Policy Guidelines on Power Generation from Non-Conventional Energy Sources, 2005	Annual Action Plan, NRLM, Odisha, 2012-13	Chapter 8. Poverty Alleviation (Poverty in Odisha), 2005	Gender Disparity Odisha, 2010	Odisha State Policy for Girls and Women, 2014
Seasonal Livelihood Diversification	-	-	-	-	-	-	-	-	-
Transport Improvements/Development	-	-	-	-	-	-	-	-	-
In India, there is Moratorium on GM Food Crop	-	-	-	-	-	-	-	-	-
Delta Infrastructure Development	X	-	X	-	-	-	-	-	-
Capacity Building	-	-	-	-	x	-	-	-	-
S H G – Women Emp. & Micro-Insurance for Female Entrepreneurs	-	-	-	-	-	-	-	-	-
Funding for flood-cyclone-multipurpose shelters	-	-	-	-	-	-	-	-	-
Mangrove Rehabilitation and additional Mangrove Afforestation	-	-	-	-	-	-	x	-	-
Forestry									
Conserving Ecosystem services							x		

Carbon sequestration									
Biodiversity Conservation and Management									
Preservation of green fodder									
Social Forestry & Farm Forestry									
Afforestation programme									
Watershed management									
Coastal and water									
Integrated coastal zone management									
Water resource management							X		
Wetland management									
Flood management							x		
Safe Drinking Water Supply									
Ground water Management									
Reclamation of Land( saline/waterlogged/degraded)									
Avoidance of inadvertent evapo-transpiration									
Land-soil-water management									
Recycling of canal seepage water									
Water harvesting programme									
Coastal aquaculture Farm management									x
Energy									
Promoting Clean development mechanism				X					
Enhancing Renewable energy capacity				X					
Energy efficiency and conservation				X	X				
Solar power implement				X					
Energy conservation building code									x
Evaluation of clean 'Green' and 'intelligent' buildings									
Hydropower generations									

Wind energy generations									
Natural gas based power plants									
Renewable Energy Resources									
Disaster									
Developing resilience to extreme weather conditions									
Prompt response to threatening disaster or situation									
Disaster risk reduction									
Evacuation rescue and relief									
Rehabilitation and Reconstruction after disaster									
Drought management							X		
Response team to disaster									
Disaster resilience construction (shelters)									
Early Warning System									
Disaster insurance									
Agriculture, animal husbandry and Fisheries									
Integrated farming systems									
Compatible agricultural strategies land levelling									
Genetically Modified Crops									
Automated irrigation operation									
SRI method of farming									
Thermal resistant crop									
Alternative cropping pattern, crop improvement				X					
Crop insurance scheme									
Soil Conservation and management							X		
Seed infrastructure development							X		
Integrated nutrient Management									
Integrated Pest Management									
Livestock Farming									

Fisheries						X			
Urbanization and transport									
Waste Management									
Long term transport plan									
Networking infrastructure									
Health									
comprehensive primary health care services									
Health programmes									
Human health and medical care									X
Gender									
Women Empowerment,									X
Mother and Child Nutrition programme									X
Mother and Child Nutrition programme									
Institutional services for women									
General									
Self-employment programmes									
Adaptation in advance technology									
Climate resilient technological options.									
IEC initiatives									
Suitable institutional mechanism									
Promote adaptive research									
Poverty alleviation									
Credit support mechanism facility									X
Technology transfer									X
Human resources development									
Rural livelihood improvement							X		
Extending Insurance coverage in general				X					