

4.1.7 COASTAL ZONE

1.0 Subject Matter (May include sub heading, data, graphs etc.)

(Should provide background / a bird's view picture and analysis using the following information/ tables)

- a) GIS Map with geo tagging
- b) Coastal zone mapping (Table 1)
- c) Coastal zone challenges (Table 2 & 3)
- d) Shoreline changes (Table 4)
- e) Availability of water by desalination, if any (Table 5A, 5B)
- f) Erosion/ Accretion in Coastal Areas (The coastal district-wise status of coastal erosion/accretion in the State along with indicative maps may be provided. The source of such information as well as the time-frame during which the said information has been derived should also be given. (Maps, Annexure-Table 6)
- g) Details pertaining to the status of coastal erosion management in the State as well as the development of Coastal Management Information System (CMIS) may also be provided) (Text)
- h) Uses of coastal water, if any (Annexure –Table 7)
- i) Discharge in coastal waters, if any (Annexure –Table 8)
- j) Area covered by aquaculture and salt pans (Text, Maps)

2.0 Availability & Utilizable Water: Temporal & Spatial basis is to be considered. – Additional water availability/ supply in coastal areas may be considered from desalination. (Text)

Table 9 includes that Water which has been added to the System through desalination of saline water from the Sea/Ocean in case of Coastal States. Such additional water volumes need to be considered in those Basin/ Sub-basin considering the location of the Desalination Plant.

Table 9

A10. Water available from Desalination Plants/ Sea Water (MCM)		REMARKS
Basin A/ Sub-basin		
Basin B/ Sub-basin		
Basin C/ Sub-basin		
TOTAL		

Table 10 would consist of that volume of water available from Desalination Plants after deducting any losses, if any due to leakages, evaporation etc. in respective Basin/Sub-basins.

Table 10

B8. Water Utilization from Desalination Plants/ Sea Water (Considering Table A10) (MCM)		REMARKS
Basin A/ Sub-basin		
Basin B/ Sub-basin		
Basin C/ Sub-basin		
TOTAL		

3.0 Issues and Challenges (Among other issues/challenges, the status of the problem of Salinity Intrusion, the on-going preventive measures and relevant studies may also be included in the Report.) including (Text, Map, Annexure-Table 11 and 12) may include:

- accelerated changes in shoreline: loss of beaches and closures of inlets,
- degradation /changes of coastal habitats and land use- land cover
- increased coastal erosion & flooding due to extreme events and sea level rise
- changes in sediment transport pattern and islands, including coral islands}
- pressures of developmental activities along the shoreline (ports, harbors etc)

4.0 Problem Tree / Root cause Analysis: Cause, Effect and Interventions (Also include aspects pertaining to the problem of coastal erosion which may include the specific causes, affected areas, vulnerable coastal sites/reaches, protected areas etc. The spatial maps showing protected coastal reaches can be prepared for facilitating planning and prioritization of coastal protection schemes in future. (Text, Maps)

5.0 Governance / Management:

- a) Coastal zone/area specific Statute / Law / Policy/ Regulations if any
- b) *Whether the proposed area / activity attracts the provision of notification of coastal regulation zone, 2011
 - i. Presence of State Coastal Zone Management Authority

- ii. Status and details of preparation state specific Integrated Coastal Zone Management Plan (ICZMP) may be included in the report
- c) Institutions governing / managing / monitoring the coastal resources and Institutional structure.
- d) Areas of Peoples/Private Participation if any- viz. presence of Shoreline Management Organization (SMO)
- e) Schemes & Financing (may include FMP, NCRMP, ICZMP etc) (Annexure- Table- 13 & 14) [Also, relevant tables on Water Financing and Economics may be looked into Chapter 7 and filled up with appropriate data/information]

6.0 Measurement, Monitoring and Data Constraints/ Management (With respect to coastal data, the data inventory pertaining to the coastal and estuarine waters and tidal hydraulics may be included in the Report. Details with respect to the coastal data parameters and data sites under focus may be included. The site-wise coastal data collection being done by the State Govt., Central Govt. and/or research institutes/agencies may also be included along with the completed as well as on-going coastal data collection programmes in the state.) (Text)

7.0 Performance Indicators: for comparison across Coastal areas / Districts/ Plants/ Units/ Products etc.

- o WATER QUALITY STANDARDS FOR COASTAL WATERS MARINE OUTFALLS, *The Environment (Protection) Rules, 1986 Tables 1.1 to 1.5.*
- o COASTAL REGULATION ZONE NOTIFICATION 2011 dated the 6 January, 2011, MINISTRY OF ENVIRONMENT AND FORESTS
- o Environment Impact Assessment, 2006 notification dated 14 September, 2006, MINISTRY OF ENVIRONMENT AND FORESTS

Category	Indicator	Bench Marking/ Units	District/ Rivers/ Desalination Plants	District/ Rivers/ Desalination Plants	District/ Rivers/ Desalination Plants
Water Measurement	Length of coastline under erosion (District-wise)				
	Area increase in coastal erosion during the last one year				
	% of tidal rivers included in data collection programme (River-wise)				
	% change in beach length / number of beach per coastal district				
	No. of coastal data type included under observation/ 9*				
	No. of Desalination plants				
	Geo-tagging of Desalination Plants				
	Whether the following data is being compiled and monitored viz., • CRZ and EIA information • Hydrodynamic data (like wind, waves, currents, tides), • Bathymetric and beach profile data (subject to approval) • Land use/land cover data • Coastal geomorphology • Coastal inventory like coastal structures, protection sites, sea walls, etc.				
	Whether Coastal Information and Management System is operational				
Management	Whether Coastal Infrastructure Management Unit (CIMU) established or not	Yes/No			
	Number of Shoreline Management organization (SMO) set up	Yes/No			

	Availability of Shoreline change digital database	Yes/No			
	Compilation of shore protection database from CWC	Yes/No			
	grid wise statistics of shoreline change	Yes/No			
	Hot spot identification and study of coastal processes associated with the shoreline change	Yes/No			
	Atlas preparation	Yes/No			
	Quarterly Performance overview of existing coastal protection measures				
Water Conservation/ Demand Management	Length of coastal Erosion affected area protected during the last 5 Years				
	% of coastal Erosion affected area protected during the last 5 Years				
	Yearly freshwater output (m3)/ Yearly Saline water Input required (m3) (Desalination Plant-Wise)				
Water Productivity	Performance of coastal structures= No. of years survived/Design Life				
	Actual yearly freshwater output (m3)/Yearly Design output(m3) (Desalination Plant-Wise)				
	Production cost of fresh water (Rs)/ Fresh water output (Kilo Litre) (Desalination Plant-Wise)				
	freshwater output (m3)/unit of electricity consumed (kWh) (Desalination Plant-Wise)				
Environment Sustainability and Water Quality	% area protected from Salinity ingress/ area liable to be affected by salinity ingress (District-wise)				
Participatory Water Management	% of coastline covered by participatory Shoreline Management Organizations (SMO) (District-wise)				
Others Economic/ Financial	% utilization of fund /allocation of fund for coastal protection (District-wise)				
	Per Capita Income of coastal communities (District-wise)				
	Contribution to State GDP by Coastal Tourism/ State GDP (District-wise)				
	Contribution to State GDP by Coastal Shipping/ State GDP (District-wise)				
	Contribution to State GDP by Coastal Fishing/ State GDP (District-wise)				

8.0 Reforms undertaken/ being undertaken/ proposed if any

9.0 Road map of activities / tasks proposed for better governance with timelines and agencies responsible for each task/activity.

Agencies responsible for collection and analysis of coastal data

Parameter	Agencies
1. Wave	
2. Current	
3. Tide	
4. Riverine Data	
5. Wind	
6. Coastal Sediment	
7. Beach Profile	
8. Bathymetry	
9. Shoreline Change	

ANNEXURE**Table 1:** Coastal zone mapping: Length, Area, Infrastructure and Problems

Districts/ Basin	Coastal length		Numbers		Numbers			
	Length	Area	Beaches	Inlets	Desalination plants	Ports	Harbours	Industries
Total								

Table 2: Coastal Zone Challenges-Mapping

District/ Basin	Problems being faced by Coastal area District wise (Yes/ No)									
	Coastal habitat	Land use/ cover	Erosion	Ingression	Land subsidence	Effluent discharge in Sea Water	Flooding	Sea level rise	Changes in Sediment transport	Development activities

Table 3: Damage due to Cyclones during 2000-2017

Cyclone	Year	District.1	District.2	District.3

Table 4: Shoreline change during 2000-2017

District/ Basin	Erosion Area (Sq. Km)	Erosion Length (km)	Accretion Area Sq. Km	Accretion length Km	Stable length

*Shoreline Vulnerability Assessment –District wise
(For details to contact ICMAM/MoES)*

District wise Classify shoreline change rates based on Linear Regression Rate statistics as erosion/ accretion/ stable/ artificial coast

Desalination:**Table 5A:** Details of **Operational** Desalinization Plants

Sl. No.	Location of Desalination Plant	Technology	Output(MLD)	Commissioned (in Year)	Total cost of Plant (Crore)	Cost Rs per litre
						NA

Table 5B: Proposed/ongoing (under construction) Desalination Works

Sl. No.	Location of Desalination Plant	Project Proponent	Technology	Output (MLD)	Total cost of Plant (Rs Crore)	Remarks

Erosion**Table 6:** Format for coastal erosion and protection status

District/ Basin	Erosion				Protection works undertaken				
	No. of Talukas/ Blocks/ Mandals	Length	Geo-tagging done	No. of persons affected	No. of Talukas/Blocks /Mandals	Length	Geo-tagging done		% of erosion protected.
							Starting Point of Work	End point of Works	

Table 7: Format for data on Use of coastal waters

Sl. No.	Purpose used	Quantity used (m ³)	Mode of intake

Discharge in Coastal Water**Table 8:** Format for data on Discharge in coastal waters

District/ Basin	Industrial discharge in coastal areas (m ³ /day)	domestic discharge in coastal areas (m ³ /day)	Quality of discharge water	Mode of discharge	Monitoring mechanism
Total					

Salinity ingression & Ground Water Contamination

Salinity ingression and contamination of ground water- coastal areas affected and its distance from the coast

Table 11: Format for providing details of salinity affected costal sites/reaches:

Sl. No	Year	Reach	Taluka, Coastal District	Salinity Affected area in Ha.

Table 12: Details of Protection Works for Prevention of Salinity Ingress:

Sl. No.	Location (Taluka, District)	Length of Embankment/Barrier (in km)			Sluice (in no)		
		Existing	Under Construction	Proposed	Existing	Under Construction	Proposed

- (Documentation of the project/issues specific studies carried out by various agencies with respect to coastal areas as well as the completed and on-going initiatives may also be included in the Report.)
- The physical and financial progress of the coastal protection schemes undertaken in the past/ongoing may also be included in the Report.

Table 13: Financial Progress of past/on-going Anti-Sea Erosion/ coastal protection Schemes:

Sl. No.	Year/ Period	Funds Allocated* (Rs. Crore)	Funds Utilized (Rs. Crore)

(* Source: State/Centre/External Assistance etc.)

Table 14: Physical Progress of past/on-going Anti-Sea Erosion/ coastal protection Schemes:

Sl. No.	Name of Scheme	Cost of the Scheme	Coastal length protected	Population benefitted	Status (Completed /in progress)