



Environmental Monitoring Report

Project Number: 40156-023
November 2015

Period: January 2015 – June 2015

IND:MFF - Sustainable Coastal Protection and Management Investment Program (SCPMIP) - Tranche 1

Submitted by

Project Management Unit, (SCPMIP), Government of Karnataka, Mangaluru

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GOVERNMENT OF KARNATAKA
[Department of Ports & Inland Water Transport]

No. PMU/ADB/EMR/ 2015-16/289

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To

M. Therasa Kho
Country Director
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New Delhi.

Dear Madam,

Sub: Submission of ADB's Environmental Monitoring Report-No 3 (Jan 2015 to June 2015) for Tranche 1 sub project under SCPMIP-K

Ref: MFF 0049-Loan 2679-IND: Sustainable Coastal Protection and Management Investment Program- Tranche 1

We are pleased to submit the Environmental Monitoring Report for Tranche 1 sub project.

The report has been prepared for the period January 2015 to June 2015 as per ADB's format and herewith we are submitting the same for your perusal.

Thanking You,

Yours Faithfully


Joint Director

Project Management Unit
Sustainable Coastal Protection &
Management Investment Program
Mangaluru

Encl: Environmental Monitoring Reports

Environmental Monitoring Report

Loan Number: 2679

Reporting period: (Jan 2015 to June 2015)

(MFF - Sustainable Coastal Protection and
Management Investment Program -Tranche
1)

Implementing Agency: Project Management Unit, Public Works, Ports and Inland
Water Transport Department

Executing Agency:

Date: (06/10/2015)

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List of Abbreviations

ADB	Asian Development Bank
CBO	Community Based Organization
CD	Chart Datum
CIMU	Coastal Infrastructure Management Unit
CMIS	Coastal Management Information System
CMZ	Coastal Management Zone
CPCB	Central Pollution Control Board
CRZ	Coastal Regulation Zone
CWC	Central Water Commission
CWPRS	Central Water and Power Research Station
Db	Decibel
DPR	Detailed Project Report
EIA	Environmental Impact Assessment
EPA	Environment Protection Act
GIS	Geographical Information System
GoI	Government of India
GoK	Government of Karnataka
HTL	High Tide Line
ICMAM	Integrated Coastal and Marine Area Management
ICZMA	Integrated Coastal Zone Management Authority
KPI	Key Performance Indicator
KSCPM	Karnataka Sustainable Coastal Protection and Management
KSCZMA	Karnataka State Coastal Zone Management Authority
KRSRAC	Karnataka State Remote Sensing Application Centre
LTL	Low Tide Line
MoEF	Ministry of Environment, Forests and Climate Change
MFF	Multi Financing Facility
NCPP	National Coastal Protection Project
NGO	Non-Governmental Organization
NHC	Northwest Hydraulic Consultants
O&M	Operation and Maintenance
P&IWT	Ports & Inland Water Transport
PMDC	Project Management and Design Consultants
PPMS	Project Performance and Management System
PPP	Public Private Partnership
PPTA	Project Preparation Technical Assistance
SCPMIP-K	Sustainable Coastal Protection and Management Investment Program – Karnataka
SEA	State Executing Agency
SEIAA	State Environmental Impact Assessment Agency
SMO	Shoreline Management Organisation
SMP	Shoreline Management Plan
SPCB	State Pollution Control Board
TMC	Town Municipal Council
ToR	Terms of Reference

1. Introduction

The National Coastal Protection Project (NCP) estimates that 50% of the total of 1,100 km of coastline in the three states of Maharashtra, Goa and Karnataka is facing erosion to some degree. Half of the 300 km coastline of Karnataka is subject to significant coastal erosion and only 58 km has some degree of protection.

The coastal zone is a key part of the economy, supporting agricultural and horticultural activities, fishing, aquaculture, sand and shell mining, harbour development, trade and transport. Rural communities and urban areas are affected by coastal erosion. Rising sea levels and increasing numbers and intensities of storms will result in serious erosion hazards. To address its coastal protection and management issues, the Government of Karnataka has agreed with the Asian Development Bank (ADB) to implement the Sustainable Coastal Protection and Management Investment Program (SCPMIP). The budget for the first tranche of SCPMIP-K amounts to US\$ 48.549 million covering the period Jan 2012 - June 2017.

Overall Project Description

The 1st Tranche sub-project in Ullal consist of 4 components viz., rehabilitation of Ullal breakwaters, construction of two off-shore reefs, construction of four in-shore berms and sand nourishment. Project layout map is provided in appendix A. A brief description and the progress so far of these sub-projects are as follows.

Inshore Berms - 4 numbers of Inshore berms are 'T' gryone like structure, forming a length of 120m each placed into sea. The construction of the four in-shore berms commenced in December 2013 and the completion date of the construction is February 2016. The construction materials used are sand filled geotextile bags and containers.

The contractor has procured 22,252 no's of geotextile bags and the stem portion of Inshore berm no 4 has been completed for a length of about 70 meter using 1356 no of 1 cum bags, 935 no's of 2.5 cum bags and 62no's of 7.5cum bags. Simultaneously, the construction of inshore berm no 2 has also started in the month of April 2015 and about 25 meter length has been constructed using 340 no of 1 cum bags and 201 no's of 2.5 cum bags

Breakwaters – The existing Ullal breakwaters are in dilapidated condition and requires immediate rehabilitation. With proposed rehabilitation, the structure will become more robust and adapted to future sea level rise. The southern breakwater will become slightly shorter to allow an increase of sand moving towards the Ullal frontage. Agreement for rehabilitation of breakwaters was signed on 31/07/2014 and the Commencement date was fixed as 01/12/2014.

Contractor deployed men & machineries at site in the month of January 2015. Presently about 4616no's of 2T and 386no's of 7T Tetrapods are casted and stacked at yard and casting in progress. Revetment portion from chainage 0 to 225 m is completed upto crest level (+5.00 m). The north breakwater portion from chainage 225 m to 325 mtrs is nearing completion with slope protection using 2 T tetrapod towards sea side upto 6.00 m crest level.

Off-Shore Reefs – Off Shore reefs are cup shaped structures to be constructed at 700m off shore at a depth of -7m w.r.t. to local Chart Datum(CD). Main function of these structures are to break the waves at off shore and reduce the wave intensity before it reaches the coastline. Agreement for construction of 2 off shore reefs was signed on 07/11/2014 and the Commencement date was fixed as 01/12/2014

The reef contractor has started the work in December 2014. Bathymetry, Geo Physical, Geo technical survey and dredging work at South reef completed. The contractor is now casting and stacking tetrapods at the stack yard in New Mangalore Port Trust (NMPT). The actual construction of reef is expected to start after the monsoon period, that is from October 2015.

Sand Nourishment is the process of transporting sand from deeper sections of the sea and feed it to the foreshore to create a new beach or widen the existing beach. Sand nourishment does not stop erosion; but is an essential component to balance the process of erosion and accretion, thus safeguarding the protection of livelihoods and properties. 2x 450,000 m³ of sand nourishment is proposed on the Ullal frontage after the construction of the above 3 components.

Project Objectives

The overall objective of SCPMIP-K is to address the immediate coastal protection needs through the implementation of economically viable protection works using environmentally and socially appropriate solutions. In order to achieve this over-arching objective for SCPMIP-K there are a number of key objectives that must be fulfilled, these being;

1. **To address the causes and likely causes of coastal erosion and coastal instability**, directed mainly at other coastal infrastructure that is presently causing, or potentially causing damage to the natural coastal processes.
2. **To support investments for natural protection measures such as the development** and planting of dunes, planting of mangrove or other trees for protection or shelter.
3. **To consider wider coastal management issues** surrounding water quality, navigational entrances, dredging and training of river and drain mouths.
4. **To consider increase of economic and amenity value** of the coast and shoreline.
5. **To develop the institutional capacities to meet the long term needs of sustainable coastal protection and management.** This includes the development of the capacities at central, state and district level in shoreline planning, detailed planning, modelling, design; and coordination and management of coastal infrastructure.

In parallel to the investment program, the project will develop institutional capacities to meet long term needs of sustainable coastal protection and management. The project will support initiatives to increase the participation of the private sector and communities in the planning, design, financing, implementation and maintenance of coastal protection and management projects. The project supports the development of a number of economic initiatives in the coastal zone; where appropriate private sector participation would be incorporated into the project strategies. All investment projects should be implemented based on participative planning, professional design using innovative approaches.

Environmental Category

The approved environment category of the Project is A; and ADB's Environment Policy (EP) (2002) is applicable for this Project.

Environmental Performance Indicators

The environmental performance indicators have been framed with the objective of carrying out project progress review. The performance Indicators has been evaluated as per following three heads:

- (i) Environmental condition indicators to determine efficiency of environmental management measures in control of air, noise, soil and water pollution.
- (ii) Environmental management indicators to determine compliance with the suggested mitigation measures.
- (iii) Indicators regarding Communication of requirements with respect to ADB's environmental & social safeguards, national & state level Environmental rules & regulations.

ADB Environmental and Social Safeguards Review Mission

A safeguard review mission visited SCPMIP-K portion of the project during 28 to 30 January 2015 to review the status of compliance with (a) Social and Environmental safeguard related aspects; (b) social and environmental loan covenants; and (c) implementation of environmental management and monitoring plan (EMMP) for the Tranche -1 project. The mission held discussions with the officials of PMU, City Municipal Council, Ullal, PMDC-K, civil works contractors, and the local residents. The mission also conducted field visits to 2 sub projects(inshore berms and breakwaters) where the civil works were in progress.

2. Compliance Status with National/State/Local Statutory Environmental Requirements

The Tranche -1 project has been accorded with CRZ clearance, apart from this the contractors are responsible for obtaining consent to establish and operate batching plants and use of DG sets if any from the Karnataka State Pollution Control Board(KSPSB). Contractors to obtain and submit Pollution Under Control(PUC) of all the construction vehicles.

Table 2.1: Subproject wise Compliance Status

SI No	Sub Project Component	Statutory Environmental Requirement	Compliance Status
1	Construction of four Inshore Berms	CRZ Clearance	Obtained
2	Rehabilitation of Ullal Breakwaters	CRZ Clearance	Obtained
		Consent to Establish and Operate batching Plant	Obtained
3	Construction of two off shore reefs	CRZ Clearance	Obtained

3. Compliance Status with the Environmental Covenants as Stipulated in the Loan Agreement

Tranche/ Town/ Sub-project/ Package	Environmental Category	Status of preparation of IEE/EIA report	Status of approval of preparation of IEE/EIA report
Tranche 1, Construction of four Inshore Berms	'A' Category	EIA prepared	EIA approved
Tranche 1, Rehabilitation of Ullal Breakwaters	'A' Category	EIA prepared	EIA approved
Tranche 1, Construction of two off shore reefs	'A' Category	EIA prepared	EIA approved

4. Compliance Status with Environmental Management and Monitoring Plans as Stipulated in the Environmental Documentation as agreed with ADB

This section presents the compliance status of Environmental Management and Monitoring Plans of tranche-1 subprojects under implementation. During this reporting period (January 2015- June 2015) all three construction works has been started. No environmental monitoring was conducted during this reporting period, but Environmental quality monitoring tender including Air quality monitoring, Water quality monitoring, noise monitoring and sediment quality analysis for period of one year is awarded to Environmental Health & Safety Consultant Bangalore by PMU . None of the contractors has submitted the site environmental plan, but the contractors are following the EMP, which is part of the EIA and respective contract document. In addition to that, guidelines on general construction EHS measures to be followed / implemented by the Contractor.

Project Activity	Potential Environmental Impact	Proposed Mitigation Measures	Monitoring Method	Compliance Status	Institutional Responsibilities
Pre Construction Stage					
Site preparation: Material and equipment staging areas and beach access locations	Possible removal of terrestrial habitat	<ul style="list-style-type: none"> Sites rehabilitated before contractor leaves site upon completion of construction activities. Planting and stabilization of site, including replacement of any native plant species. 	Visual Observation	Complied. There is no terrestrial habitat present near the proposed sub project sites. Although the PMU will make sure the site will be rehabilitated, if required before the contractor leaves.	PMU Contractor
Construction Stage					
Berm Construction Offshore reef construction. Breakwater construction	Air quality	Physical			
	Reduction in Air quality from exhaust fumes and dust at on-land construction sites	<ul style="list-style-type: none"> Adherence to national emission and ambient quality standards Engines and generators turned off when not in use Equipment conforms to international standards. Dust suppression by regular sprinkling of water (i.e. morning and evening) or other means. Possibly, halt work during excessive onshore winds. Verbal social complaints dealt with immediately and efficiently. 	Visual Observation, AAQM once every season.	Complied. Water sprinkling is being done. Contractors have been instructed to submit Pollution Under Control certificates.	PMU Contractor

	Noise Increased noise levels	<ul style="list-style-type: none"> • Adherence to national noise standards. • Engines and generators turned off when not in use • Equipment conforms to international standards • Vehicles and engines fitted with silencers • Daily checks and remedy of potential sources of excessive noise especially out of daylight hours. • Complaints regarding noise dealt with professionally and with respect. • Rock transport plan from quarries to rock transshipment Storage site prepared and adhered to. 	Noise monitoring, visual observation	Complied. Engines and generators are being turned off when not in use. Contractors yet to submit PUC certificate.	PMU Contractor
	Water quality High turbidity during reef filling Possible leaks or spills sediment, fuels, oil, other fluids	<ul style="list-style-type: none"> • Supervision of all operation procedures to minimize spillage of sand • Contingency plans for accidental oil, fuel, and sediment spills should be initiated immediately 	Water quality monitoring, visual observation	Complied. Site engineers are visually monitoring for spillage of sand and oil during construction.	PMU Contractor
		Biological			
	Marine biota and habitat Reefs and berms will cover soft-sediment benthic habitat and biota High turbidity and sediment settlement temporarily impair photosynthesis and biological production in adjacent offshore areas Possible leaks or spills sediment fuels, oil, other	<ul style="list-style-type: none"> • Develop mitigation components based a review and characterization of fish and invertebrates that occur in the near shore area and estuary including seasonal or migratory species and sensitive times and locations. • Reefs structure is expected to be colonized by biota offsetting smothering soft-sediment biota. • Minimize sediment release during construction to reduce affected area outside immediate reef-site area • Implement contingency plans if 	visual observation for oil spills	Offshore construction activities related to reefs are yet to start. In construction of Inshore Berms, sediment release is bare minimum as the geotextile containers and bags are closed tightly after the sediments filled and compacted within.	PMU Contractor PMU Contractor

	fluids	spills of sediment, fuels Oil, or other fluids occur			
		Social, Economic and Cultural			
	Safety and human health Reduced safety of beach users	<ul style="list-style-type: none"> • Public consultation to identify locations, times, and types of potential safety risks, and develop site-specific advisories and safety measures. • All equipment, waste, and construction material debris must be inspected and removed daily from site. 	visual observation	Partly Complied. Construction site partly barricaded with safety signs installed at critical locations. Materials and wastes are located at secure / designated locations	PMU Contractor
	Tourism: Beach amenity and recreational use disturbed	<ul style="list-style-type: none"> • Public consultation to identify locations, times, and types of potential safety risks, and develop site-specific advisories and safety measures. • All equipment, waste, and construction material debris must be inspected and removed daily from site. 			
	Fishing activity Disturb traditional fishing activity	<ul style="list-style-type: none"> • Public consultation to identify locations, times, and types of potential conflict, and develop site-specific measures to minimize disruption of boat launching and fishing activity 			
	Navigation Local navigation	<ul style="list-style-type: none"> • Vessel movement and equipment operation to be carried out in consultation with stakeholders to avoid interference with navigation. 			

5. Approach and Methodology Engaged for Environmental Monitoring of the Project

The Tranche 1 sub project Monitoring has been divided into three heads viz., Measurement of Coastal data, Baseline Surveys and Environmental Monitoring and apart from this, visual site inspection also plays an important role in identifying impacts. The parameters under these heads are as follows:

A. Measurement of Coastal Data

- i. Waves (height, direction & time period)
- ii. Current measurements
- iii. Water levels

B. Baseline surveys

- iv. Bathymetry survey (Seabed level changes)
- v. Topo survey (Beach profiles, Crest levels)

C. Environmental Monitoring

- vi. Ambient Air Quality Monitoring
- vii. Marine Water Quality Monitoring
- vii. Noise Monitoring
- viii. Sediment Analysis

The Environmental Monitoring parameters have been selected based on the EMP prepared during the Project Preparatory Technical Assistance (PPTA) stage and further parameters such as Measurement of Coastal Data and Baseline surveys have been added to ensure the sub project performance.

Table 5.1: Tranche 1 Monitoring Programme

S.No	Description	Coverage area	Units	Frequency in Months
1	Measurement of Coastal Data			
	Wave	1	LS	Continues
	Tide monitoring	1	LS	Continues
	Current	1	LS	6
2	Baseline Surveys			
	Bathymetry survey	5.945	Sq km	6
	Topo survey	183200	Sqm	6
3	Environmental Monitoring at two stations			Once in a season expect monsoon
	Ambient Air Quality Monitoring			
	Marine Water Quality Monitoring			
	Noise Monitoring			
	Sediment quality (chemical)			

6. Monitoring of Environmental Receptors/ Attributes

Monitoring for environmental aspects like air, water, noise and sediment is part of the larger monitoring scheme. The monitoring scheme also includes monitoring the performance of the coastal structures on the adjacent beaches, wave and tide level monitoring. The beach level variations are measured by conducting 6 monthly beach topography survey as well as bathymetry surveys. The proposed monitoring scheme is as presented in Table 5.1 including various parameters, duration and frequency of monitoring

The baseline data of environmental parameters, waves, tides , current, beach profiles have been generated and are available at PMU.

The Environmental Monitoring is been outsourced to an MoEF accredited lab. The Environmental Monitoring Contract is awarded to Environmental Health & Safety Consultant, Bangalore and they will be carrying out monitoring for financial year 2015-2016.

7. Details of Grievance Redress Committee and Complaints Received from Public and Action Taken Thereof to Resolve

Grievance redressal is being handled by PMU. However a formal Grievance Redressal Committee (GRC) is yet to be established for the implementation of tranche 1 sub project of SCPMIP to ensure that grievances are addressed in a timely manner, facilitating timely project implementation. Grievances of Affected Persons (APs) will be first brought to the attention of the Joint Director who is working full time at PMU. Grievances not redressed by the PMU will be brought to the Grievance Redressal Committee (GRC) of District Commissioner level.

The GRC will be chaired by the District Collector. GRC will determine the merit of each grievance, and resolve grievances within a month of receiving the complaint by the project affected people or the project implementing agency. If grievances are not addressed by the GRC of DC, further grievances will be referred by APs to the appropriate courts of law. Records will be kept of all grievances received including: contact details of complainant, date of the complaint received, nature of grievance, agreed corrective actions and the date of these were effected, and final outcome.

8. Follow –up Actions and Conclusion

PMDC-K and PMU have assessed the implementation of EMP during the reporting period, as mentioned in the previous report, some areas such as safety arrangements and usage of personal protective equipment (PPE) by the construction workers require to be improved further. PMU has instructed the civil work Contractors to take appropriate mitigation actions to improve implementation of EMP, worker safety measures, dust control measures by carrying out regular water sprinkling in dust prone areas and to ensure that all workmen and staff employed on site use safety gear provided to them. Correspondence has been made to contractors regarding safety maintenance, implementation of EMP etc. As all three package works are in progress now, following are the key area needs attention and further improvement.

- Submission of PUC certificates by all three contractors
- Use of personnel protective equipment of all workers.
- Safety at construction sites.
- Sanitation & housekeeping of camp.
- First Aid facility.
- HIV/AIDS awareness camp
- Health checkup camp

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Appendix A. Location Map of Monitoring Station

Figure A.1: Location Map of Monitoring Station for Trance-1 Sub Project



Appendix B. Site Photographs

Figure B.1: ADB Safeguard Review Mission Visit Pictures



Figure B.2: Inshore Berm



Figure B.3: North Breakwater



Figure B.4: National Safety Day Celebration by Reef Contarctor on 4th March 2015



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