AMENDMENT

ENVIRONMENT MANAGEMENT FRAMEWORK

Odisha Integrated Irrigation Project for Climate Resilient Agriculture (OIIPCRA)

SUMMARY NOTE FOR SILT MANAGEMENT PLAN

OIIPCRA aims to intensify and diversify agricultural production, enhance climate resilience and improve water productivity in selected districts of Odisha. This is expected to be achieved through project investments under three technical components. Investments under the "Climate-Smart Intensification and Diversification of Production" component will intensify production, strengthen farmers' capacity to adapt to climate change stresses affecting crop and aquaculture production, diversify production, especially in Rabi in response to market demand, and improve farmers access to markets. Project support under the "Improving Access to Irrigation and Water Productivity" component will support the first component by improving reliability of irrigation water supply and **increasing water storage capacity**.

The project has not proposed any tank de-silting activity through any of its developmental activities at the time of project agreement though large-scale silt removal up to 0.5 million cum is allowed in the EMP. The Project Appraisal Document (PAD) on Environmental Safeguards lays out the Environmental Management Framework (EMF) for the project which includes a standalone Environmental Management Plan (EMP) for civil works. This Silt Management Plan is an amendment to the EMP to take-up tank de-silting activity under civil works in the project Component-2A. The Silt Management Plan (SMP) is prepared for the implementing departmental officers, the executing agencies/ contractors and the stake holder farmers and other entities who are considered as beneficiaries to the activity under the Environment Management Framework of OIIPCRA. The SMP is mandated to be adopted under the project where de-siltation of tanks is envisaged as a part of civil works. The abstract proposals and provisions under this plan have been outlined here with as under:

1. Tanks will be considered for de-silting of tank bed limiting to a maximum volume of excavation up to 50 thousand cum in a tank.
2. The tank bed will be desilted for an average depth of 1.0 m to increase the live storage capacity.
3. A fish refuse may be created with an additional depth of excavation of 1.20 m below the sill-level of canal/ head regulators in 60% of the area selected for desilting at head regulator sill-level as a contingent storage for implementing tank fishery activities. No blasting or removal by chiseling of rock bed in this zone would be allowed.
4. A specific guidance note has been provided separately in the SMP for the Implementing Authority and the Contractor/ Executing agency.
5. A pre-assessment of quantity and type of silt/soil along with pre-defined silt disposal plan for taking up de-silting of tanks are recommended in the SMP.
6. The Silt Management Plan will be a part of the bid document and approved site-specific silt management plan will be an integral part of signed contract document.

7. The silt/soil sample shall be collected from at least two (2) different locations of each tank at 0.5m. depth and another at 1.5m. depth from bed level for laboratory analysis to assess utility/nutritive value of silt/soil.
8. A table of testing parameters and limitations is laid down in the SMP to easily identify and assess utility/nutritive value of the silt/soil.
9. The members of the Pani Panchayat would be preferred over other entities to use the silt/soil with nutritive value excavated from the tank.
10. The silt/soil with no utility or no nutritive value will be preferably used in the strengthening of the tank bund, filling low lying areas or construction/development work of Government/ public infrastructures.
11. The SMP contains two parts as; Section-A providing guidance/ instructions for silt management and Section-B as a guidance to prepare site specific silt management plan to be implemented by the executing agency / contractor and record keeping.

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Silt Management Plan

SECTION – A

5.1 Guidance Note for Minor Irrigation Organisation

i. OIIPCRA shall provide basic information and clearly visible pictures of each project tank (as per **sub-section 5.1: Basic Site Info**) along with Tender document.

ii. Divisional Engineer of Minor Irrigation Division (DE) shall take-up testing of silt quality analysis in any NABL (National Accreditation Board for Testing and Calibration Laboratories) accredited soil testing laboratory. Silt sample shall be collected from at least two (2) different locations of each MI tank. At each location, one sample at 0.5m. depth and another at 1.0m. depth from bed level shall be collected for laboratory analysis or any approved methods of testing to assess utility/nutritive value of silt/soil accumulated in the tank. Silt/soil parameters as indicated in **Annexure-1** shall be tested and estimated for quantity of nutritive/ non-nutritive silt and enclosed in tender document.

iii. Divisional Engineer (DE), MI Division, shall assess the silt category wise quantum of silt expected to be generated and provide same information to be indicated in the tender document.

iv. Beneficiary selection plan for distribution of silt shall be prepared and made part of tender document and the Water User Association (WUA)/Pani Panchayat (PP)/Divisional Engineer (DE) on joint verification shall prepare the silt disposal plan preferably identifying low laying Government land for disposal of silt and provide information (road way distance, address, owner of land, capacity and map showing disposal site) on same into tender documents. Any changes required in the silt disposal site/ plan shall be re-approved by Divisional Engineer (Minor Irrigation) with the consent of the contractor and WUA/PP.

v. The DE along with Support Agency and Pani Panchayat (WUA) should do regular monitoring and correspondence with the contractors for proper disposal of silts.

5.2 Guidance Note for Contractor

Awarded contractor has to prepare site specific silt disposal plan as per **sub-section: 5.2 Site Specific Silt Management Plan** within 15 days from the date of Signing of Contract and get it vetted by respective Divisional Engineer (MI Division). The approved site-specific silt management plan will be an integral part of signed contract document.

1) Basic principle for silt disposal

a) Temporary storage location and phase wise silt requirement by different users shall be mapped prior to desiltation operation.
b) Contractor shall obtain permission from Divisional Engineer (MI Division) for temporary stacking of desilted material in Government Land/ barren land/ fallow land. Contractor shall also make agreement with private land owners for any temporary stacking of desilted material in private land;
c) Contractor shall obtain prior written permission from the owner of the land where silt disposal is planned for temporary stacking or final disposal as the case may be.
d) Prior to the approval, the land owner will be explained on the disposal plan, soil characteristics, quantities and other key elements of the soil and these will form

the minimum details in the agreement between the Contractor and the land owner.

e) Contractor shall ensure that disposed material does not washed back into the tank bed or contaminate any water bodies.
f) Desilted material should not be used for filling up of wetlands and water bodies.

2) Steps for silt disposal plan Preparation:

Broadly, two important methods can be adopted for disposal of silt viz. disposing the silt with utility/nutritive value and disposing the silt with no utility/nutritive value. The processes or steps to be followed for each of the two methods of silt disposal are given hereunder:

3) Steps for disposing silt with utility/nutritive value

i. **Identification of silt disposal sites**: The silt with utility/nutritive value can be reused or disposed for five different purposes in order of preference, viz; (1) Levelling of low lying portion of farm land for agricultural purposes; (2) using for tank bund or embankment strengthening; (3) allow other users to use it as filling material for construction and other purpose; (4) using for road construction or strengthening and (5) dumping the excess silts in a place which is away from the tank periphery and free from habitation

ii. Contractor shall explore all such reutilization options before initiation of desiltation work. Plan of work for temporary stacking for dewatering purpose, and reutilization options with capacity shall be developed prior to initiation of desiltation operation and same shall be vetted by project manager.

iii. Levelling of low-lying portion of firm land and use it on high land for vegetable cultivation will be given utmost priority. Any left-out portion shall extensively be used for project work like embankment filling, levelling and strengthen purpose. Remaining portion after fulfilling the fast two priorities shall be used for regular maintenance of village road damaged due to project work. Left out portion shall be distributed among local people/ building contractor for construction related work/ filling of low-lying area. Any excess material will be dumped in nearby Government land available within one kilometer radius with the consent of Gram Panchayat.

iv. **Consent of farmers for disposing silts in their agriculture field**: Before conveyance to low lying portion of firm land and use it on high land for vegetable cultivation, the following steps should be taken-up: (a) Sensitization and mobilization of farmers for application of nutritive silt; (b) Proper documentation with farmers about the quantum of silt to be used by each of them; (c) Prepare plan for conveyance of silt to the agriculture land/ high land for vegetable cultivation. Priority shall be given to farmers of the respective tank command area. Silt shall be distributed among non-command farmers (if any such situation arise) only after fulfilling demand of farmers of respective MI tank command area.

v. A plan also needs to be developed for dumping the remaining or excess silt. The dumping site can be designated as “silt bank” or “silt tank”. Primarily the disposal site has to be carefully identified based on proper mapping of the locality and identification of suitable place accordingly in order to avoid untoward situation at the disposal site.

vi. According to the plan, the contractor will transfer silt material at his cost to the designated place up to a distance of one (1) kilometer to dispose the silt for various purposes. If the same land is beyond one-kilometer distance from the tank site, the DE must work out plan and budget for conveyance of silt by the contractor to the dumping site.

4) Steps for disposing silt with no utility/nutritive value

i. Identification of silt disposal sites: Special attention needs to be given especially for disposing the silt with no utility/nutritive value. Preferable reutilization option for silt disposal should be for levelling and strengthening of tank bund/ embankment. Any left-out quantity can be used as filling material for building construction work taken up by any WUA member. Remaining portion can be utilised for road construction project as filling material or dumped at naturally depressed land (with the consent of Gram Panchayat). In this regard, the first step would be to identify the naturally depressed land for dumping the silt. The district administration (District Collector and Revenue Department) shall be consulted to find out the naturally depressed land for disposal.

ii. Necessary documentation shall be done by the Divisional Engineer of MI department with the district administration for disposal of silt in such naturally depressed land.

iii. If the same land is beyond one kilometer distance from the tank site, the DE must work out plan and budget for conveyance of silt by the contractor to the dumping site.

iv. Accordingly, the contractor can be engaged to dump the silt in the identified naturally depressed land.

v. De-silted material can be stacked temporarily on MI tank beyond the embankment for dewatering purpose for a maximum period up to 10 days with proper measures to avoiding any damages to adjacent fields.

Contractor shall maintain a register of silt disposal record as per below table:

Date:	Name of Beneficiary:	Beneficiary home address:	Plot No. & Khata No.:	Plot area (in Ac.):	Road way distance from MI tank (in meter):	Quantity disposed (cum):	Beneficiary Signature
1	2	3	4	5	6	7	

5) Beneficiary Selection Criteria:

Beneficiary shall be a member of WUA/PP. Marginal and small farmers will be given priority over the medium and large farmers. Levelling of low-lying portion of firm land located within command area will be given priority to Women and SC/ST farmers during beneficiary selection.

5.3 Rating chart for soil test values **Annexure-1**

Sl. No.	Indicator	Unit	Nutritive Soil				No/ less nutritive Soil			
			Value range	Category	Value range	Category	Value range	Category	Value range	Category
1	Soil pH	-	≥ 6.5 to ≤ 7.5	Neutral	-	-	< 6.5	Acidic	> 7.5	Alkaline
2	Electrical conductivity (EC)	dS/m	< 1.0	Normal	-	-	≥ 1 to ≤ 2	Critical	> 2.0	Injurious
3	Organic Carbon (OC)	%	≥ 0.5 - ≤ 7.5	Medium	≥ 7.5	High	< 0.5	Low	-	-
4	Available Nitrogen (N)	Kg/Ha	≥ 240 - ≤ 480	Medium	≥ 480	High	< 240	Low	-	-
5	Available phosphorus (P2O5) - Dry method	Kg/Ha	>11 to 22	Medium	≥ 22	High	< 11	Low	-	-
6	Available potassium (K2O)	Kg/Ha	110 to 280	Medium	≥ 280	High	< 110	Low	-	-
7	Available calcium (Ca)	mg/kg	≥ 15	Good	-	-	< 15	Deficient	-	-
8	Available magnesium (Mg)	mg/kg	≥ 1.0	Good	-	-	< 1.0	Deficient	-	-
9	Available Sulphur (S)	mg/kg	>10 to 20	Clean	> 20	Satisfactory	< 5.0	Very Low	5 to 10	Low
10	Available zinc (Zn)	mg/kg	> 1.0	Adequate	-	-	< 0.5	Low	0.5 to 1.0	Marginal
11	Available Iron (Fe)	mg/kg	≥ 0.2	Adequate	-	-	<0.2	Low	-	-
12	Available manganese (Mn)	mg/kg	≥ 1 .0	Adequate	-	-	<1.0	Low	-	-
13	Available copper (Cu)	mg/kg	≥ 2.5 to ≤ 4.5	Marginal	≥ 4.5	Adequate	<2.5	Low		
14	Available boron (B)	mg/kg	> 0.5 to ≤ 0.75	Clean	≥ 0.75	Satisfactory	0.2 to ≤ 0.5	Low	<2.0	Very Low

[1] https://www.researchgate.net/figure/Rating-chart-for-soil-test-values-Ramaraju-2000_tbl3_338621844

[1] https://agritech.tnau.ac.in/agriculture/agri_soil_soilratingchart.html

SECTION – B

5.4 Basic Site Info *

[DE (MI) shall prepare this sheet for each project tank and include it in tender document]

Name of Tank:					
Name of Block:					
Geo-Location:	Latitude:		Longitude:		
Tank Size (Ac.):					
Quantum of silt (m3):		Nutritive:		Non- nutritive:	
Command Area (Ac.):					
Agroclimatic Zone:					
Soil Type:					
Purpose of Water Use:		Agriculture	Horticulture	Pisciculture	
Cropping Season:		Kharif (Paddy)	Rabi (Wheat / pulses)	Summer (e.g., vegetable)	
Major Seasonal Crops Cultivated (1)					
Major Seasonal Crops Cultivated (2)					
Major Seasonal Crops Cultivated (3)					
Tank Photograph:					
Distance of identified disposal site:					
Address of disposal site:					
Name of Land owner:					

* Attach village cadastral map showing the excavation site and silt disposal site

5.5 Site Specific Silt Management Plan

Contractor shall develop the following matrix with sufficient detailing. A map showing temporary storing as well as final disposal sites shall also be attached along with Work programme and plan for disposal of desilted material.

a. Work Package No. & Name of Contractor:

b. Name & Address of MI Tank:

c. Latitude and Longitude of MI Tank:

5.6 SILT DISPOSAL ASSESSMENT FORMAT **Annexure-2**

Sl.	Description	With utility/ nutritive value (in Cum)	No utility/ nutritive value (in Cum)	Remarks
1.	Quantity of silt material to be generated			
2.	Quantity to be reutilized (as per Annexure-3)			
3.	Left over quantity requires disposal			
	Gross Total:			

5.7 Silt Disposal Record **Annexure-3**

Silt disposed for the purpose: (indicate codes for disposal as in Annexure-4)	Name & Address of Beneficiary/ Plot Owner/ name of the place to dispose:	Area of Plot (in Ac.):	Distance from MI tank (in meter):	Type of Silt and Quantity to be disposed: (in Cum)	Type of Land:	Present use of land:	Presence of stream/ water body within 300 meters: (Yes/ No)
1	2	3	4	5	6	7	8
Temporary Stacking for Dewatering							
Gross Total:							

Annexure-4

Code	**Description for silt disposal options**
Agri-field	Levelling of low laying portion of firm land and use it on high land for vegetable cultivation
Embankment	Embankment filling/ levelling and strengthening
Road	Use in strengthening of damaged road
Earth fill	Distribute to other users (non-Agriculture fields)

Signature of Contractor:

Name of Contractor:

Date of Submission: