

Feasibility study for dredging of the Odaw Drainage Basin in Ghana

KickOff-Meeting 15/05/2019

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KO-Meeting Agenda

- The Consortium
- The Project Team – Key Experts
- The Project Team - Organisation
- Aim of the Project
- Project Area
- Scope of Work
- Approach
- Schedule
- Methodology per task
- Q&A

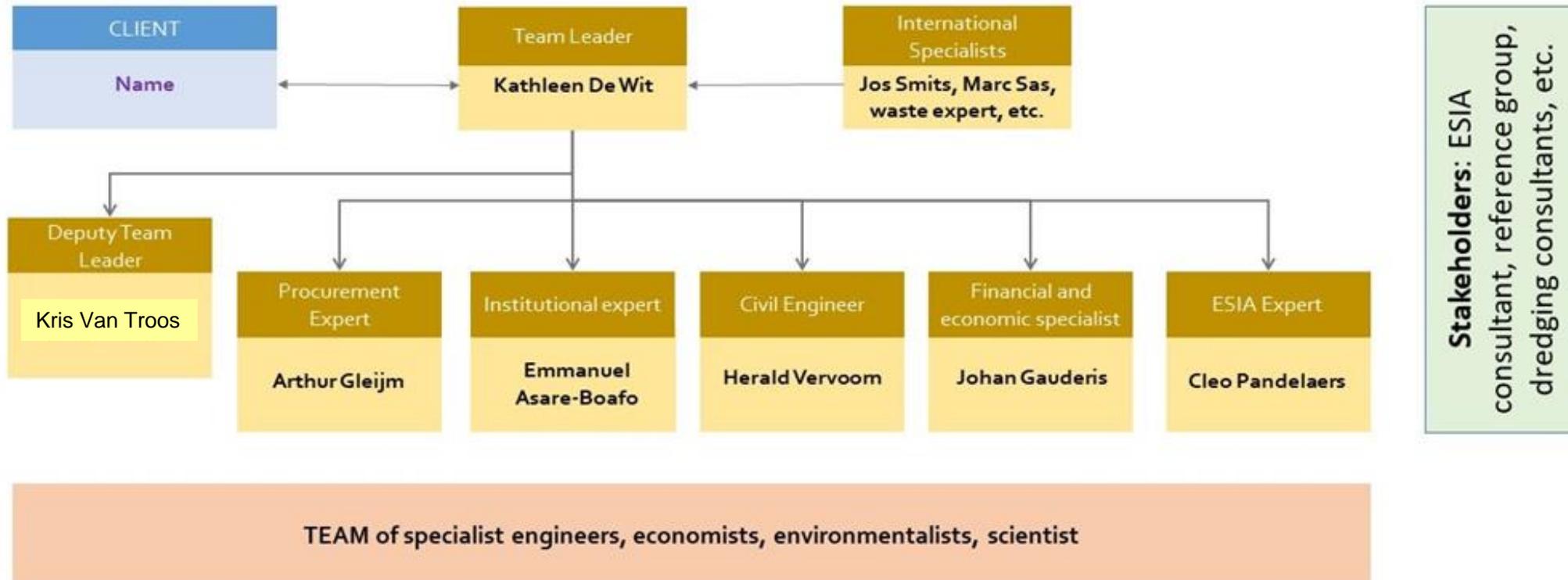
The Consortium

- International Marine and Dredging Consultants (IMDC)
- CDR International
- ADK Consortium
- Rebel Group International

Project Team – Key Experts

Role	Key expert	Consortium partner	Years of experience	Education
Team Leader	Kathleen De Wit	IMDC	20	MSc
Deputy Team Leader	Kris Van Troos	IMDC	15	MSc
Procurement Expert	Arthur Gleijm	Rebel	>25	MSc
Institutional Expert	Dr. Emmanuel Asare-Boafo	ADK	22	PhD
Civil Engineer	Herald Vervoorn	CDR	20	MSc
Financial Expert	Johan Gauderis	Rebel	31	MSc
Hydraulic Expert	Peter Ratinckx	IMDC	33	MSc
ESIA	Cleo Pandelaers	IMDC	10	MSc

Project Team - Organisation



Aim of the Project

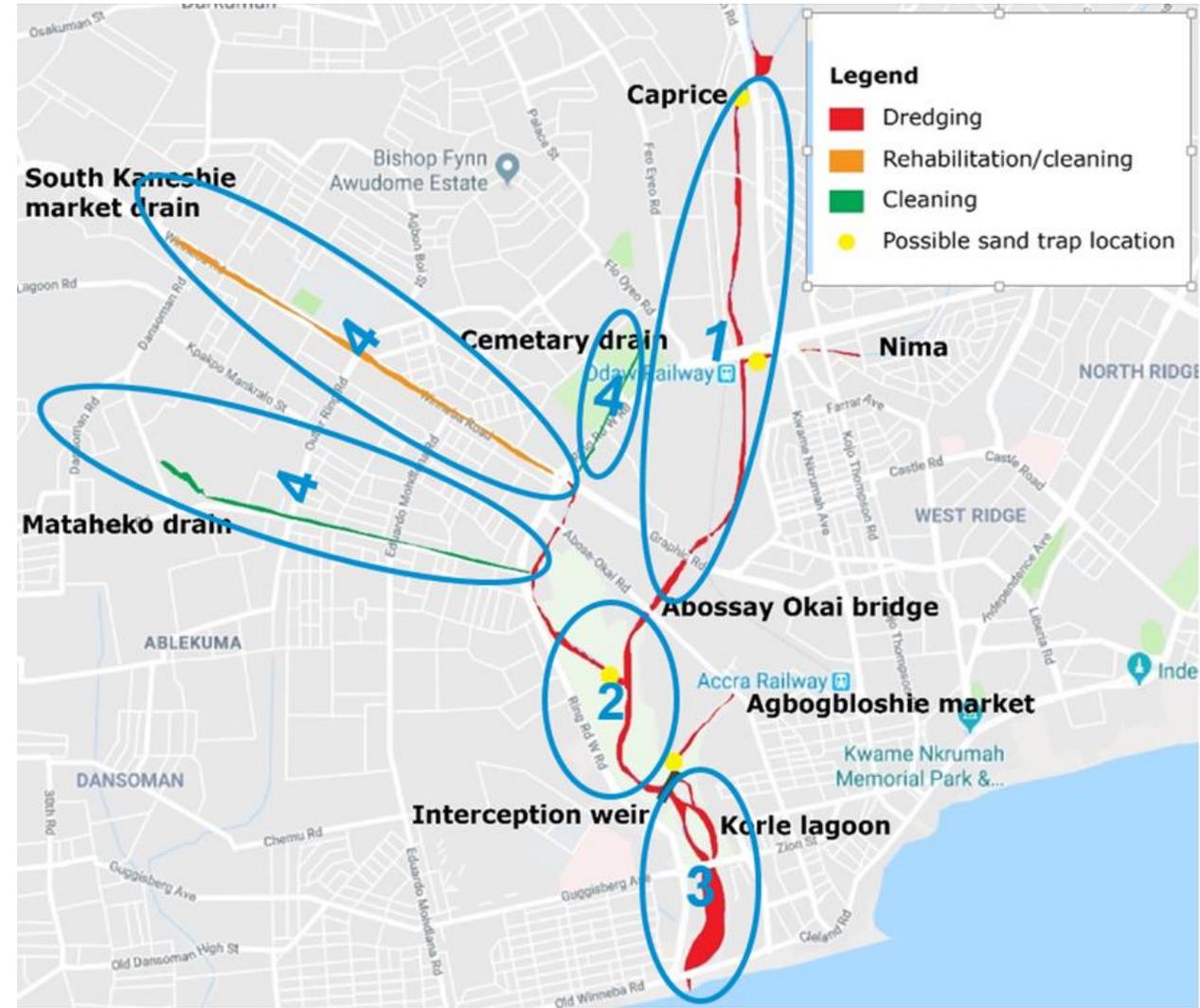
The overall objective is to contribute to achieve a 1 in 10 years flood protection (T10) in the primary Odaw channel system as part of the Greater Accra Resilient Integrated Development (GARID) project, by deferred and long-term routine maintenance dredging works.

To provide information regarding scope, feasibility and preliminary engineering design for the dredging contract.

To prepare ready-to-tender Performance Based Contracting (PBC) document package.

Project Area

1. Caprice – Abossay Okai bridge
2. Abossay-Okai bridge – Interception weir
3. Interception weir – Sea
4. Main Odaw River tributaries

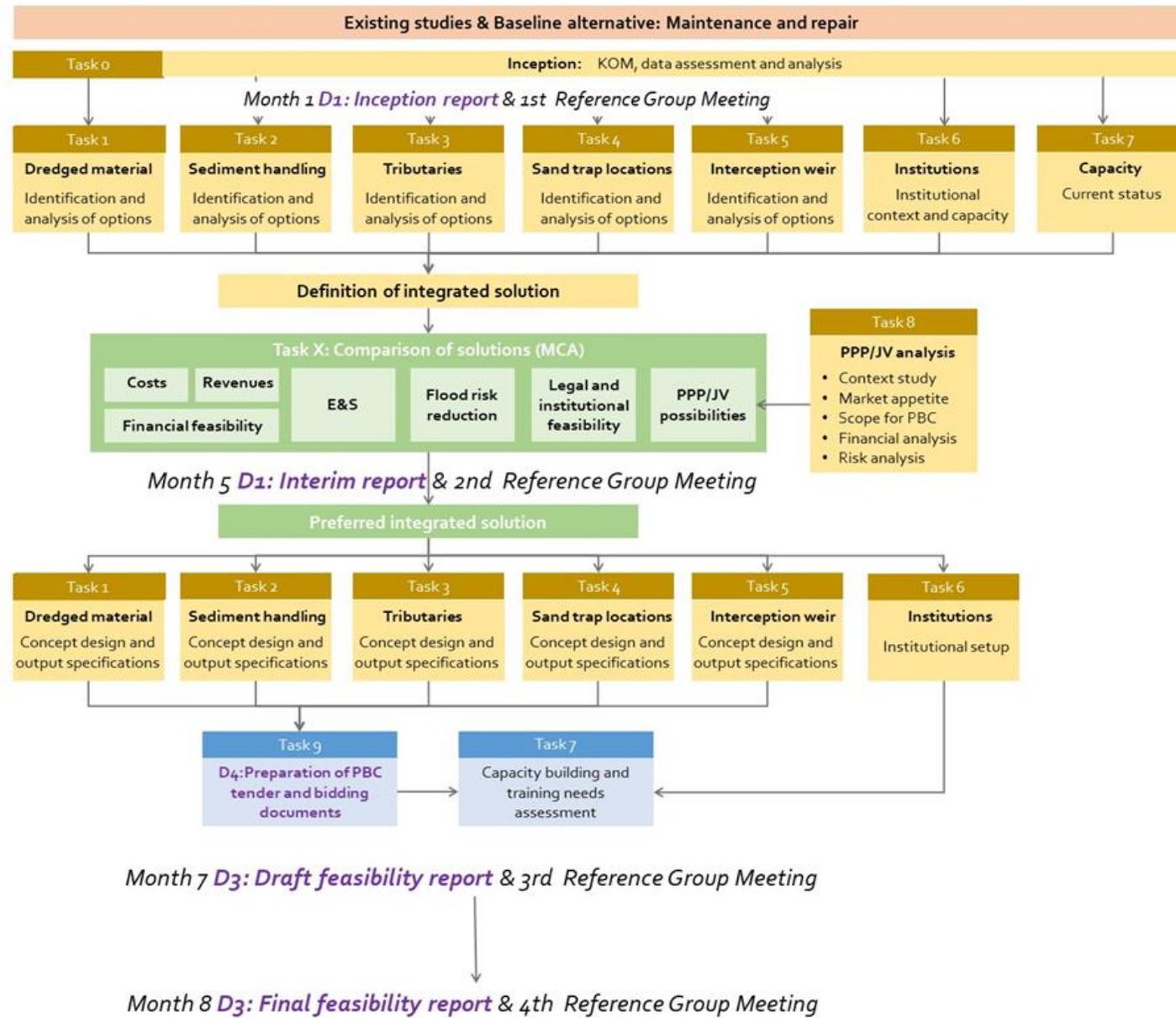


Scope of Work

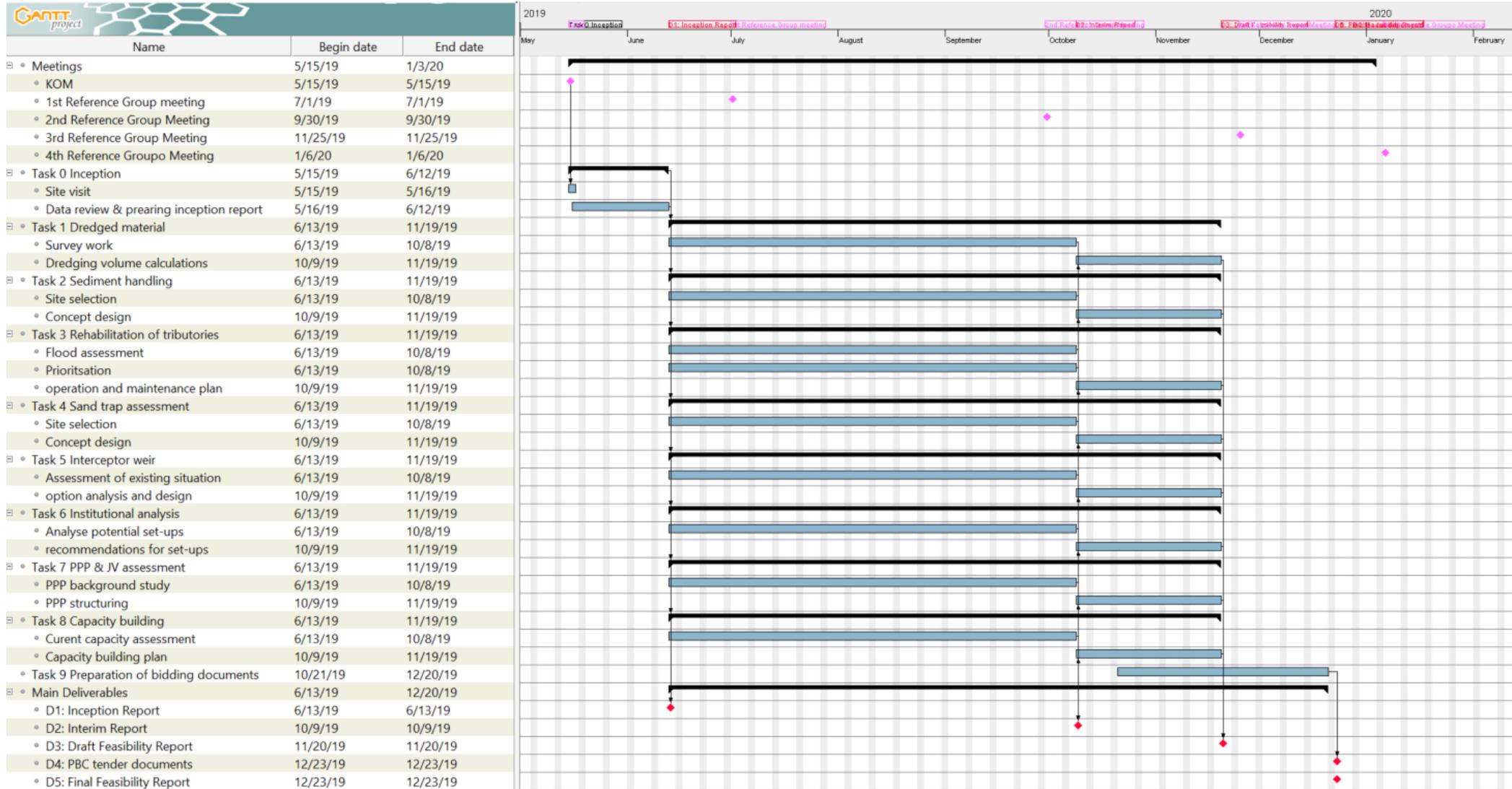
- Task 0: Inception
- Task 1: Dredged material
- Task 2: Sediment handling and selection of deposit location
- Task 3: Cleaning and rehabilitation of tributaries
- Task 4: Assessment of sand trap locations
- Task 5: Assessment of possibilities to give interception weir function (dredging purposes)
- Task 6: Institutional analysis
- Task 7: PPP and joint venture possibilities and risks
- Task 8: Capacity building and training needs assesment
- Task 9: Preparation of PBC tender and bidding documents

Approach

Interactions: MWH, ESIA consultants, Reference Group, PIU, Contracting Authority, Dredging contractors



Schedule



Methodology – Task 0: Inception

1. Kick-off meeting aligned with a site visit

- KO-meeting
- Site visit
 - Korle Lagoon
 - Defined Tributaries

2. Data collection

- Data collection
- Review of previous studies

D5 Final Feasibility Report



DI Inception Report



Methodology – Task 1: Dredged material

1. Characterisation of sediment to be dredged

- Sampling
- Analysis & testing of sediment:
 - Physical (chemical, biological)
 - Degree of pollution

3. Calculations

- Dredging volumes: deferred & maintenance
 - Conceptual design
- Dredging cost
 - Most appropriate methodology

2. Survey

- Assessment of yearly sediment loads
- Data collection
- Watersampling

3. Use and re-use dredged materials

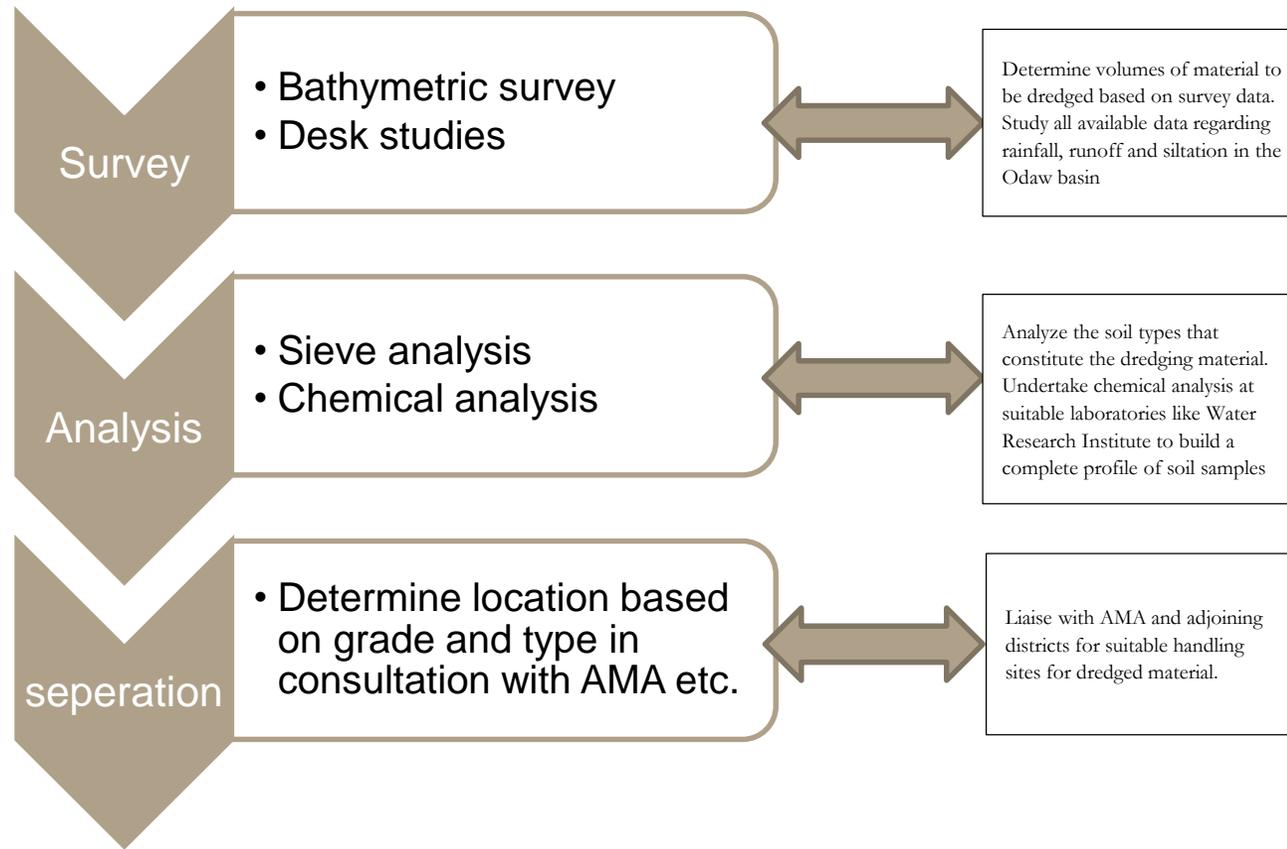
- Assessment condition and legislation
 - Link water quality and sediment contamination with ESIA study

D5 Final Feasibility Report

D2 Interim Report

Dredging zone		GD	BD	WID	CSD	SDP
Estuary	1					
	2					
	3					
Channel	4					
	5					
Berth Pockets	6					
	7					
	8					
	9					
	10					
	10					

Methodology – Task 1: Dredged material



Methodology – Task 2: Sediment handling and selection of deposit location

1. Drainage material disposal options

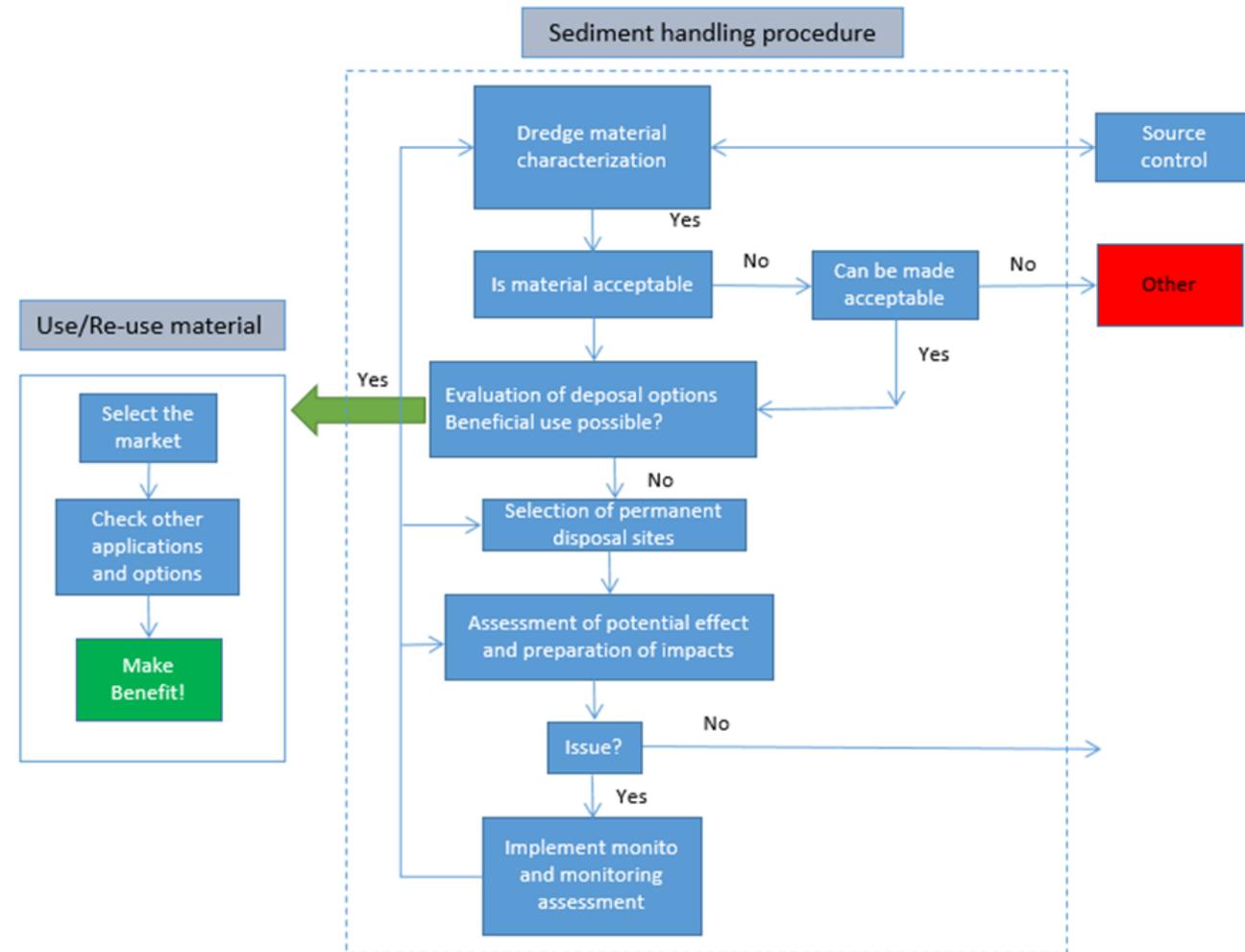
- Environmental considerations, economic & operational feasibility
- Beneficial uses of material:
 - Re-use of sand
 - Sand wash
- Disposal options

2. Site selection for deposit area

- Input local authorities/stakeholders
- Multi-criteria analysis

3. Conceptual design

- Dredged material procedure



D2 Interim Report / D5 Final Feasibility Report

Methodology – Task 3 – Cleaning and rehabilitation of tributaries

1. Assessment of occurrence and severity of floods

- Flood assessment
- Inventory of drains and hydraulic capacity control
- Characterization of types of clogging (debris, waste, litter, soil, sand, cement, ...)
- Locality assessment of dredging, cleaning and rehabilitation of drains

2. Needs and prioritization of dredging, cleaning and rehabilitation of drains

- Conceptual design and methodology
- Sedimentation reduction and prevention measures
- Accessibility, interventions and prioritization
- Preliminary cost estimations

3. Sustainability of the proposed solutions

- Constraints and requirements
- Links with operation and maintenance of the interceptor, the lagoon drainage capacity, ...

4. Operation and maintenance plan

- Regular/frequent inspection
- Regular/frequent
- Interventions and prioritization
- Preliminary cost estimations

D2 Interim Report

D3 Draft Feasibility Report

D3/D5 Draft/Final Feasibility Report

Methodology – Task 4 – Assessment of sand trap locations

1. Site selection

- Sand trap location assessment
- Multi criteria analysis
- (Preliminary) design
- Quantification of expected impact on annual dredging

**Site selection report
D2 Interim Report**

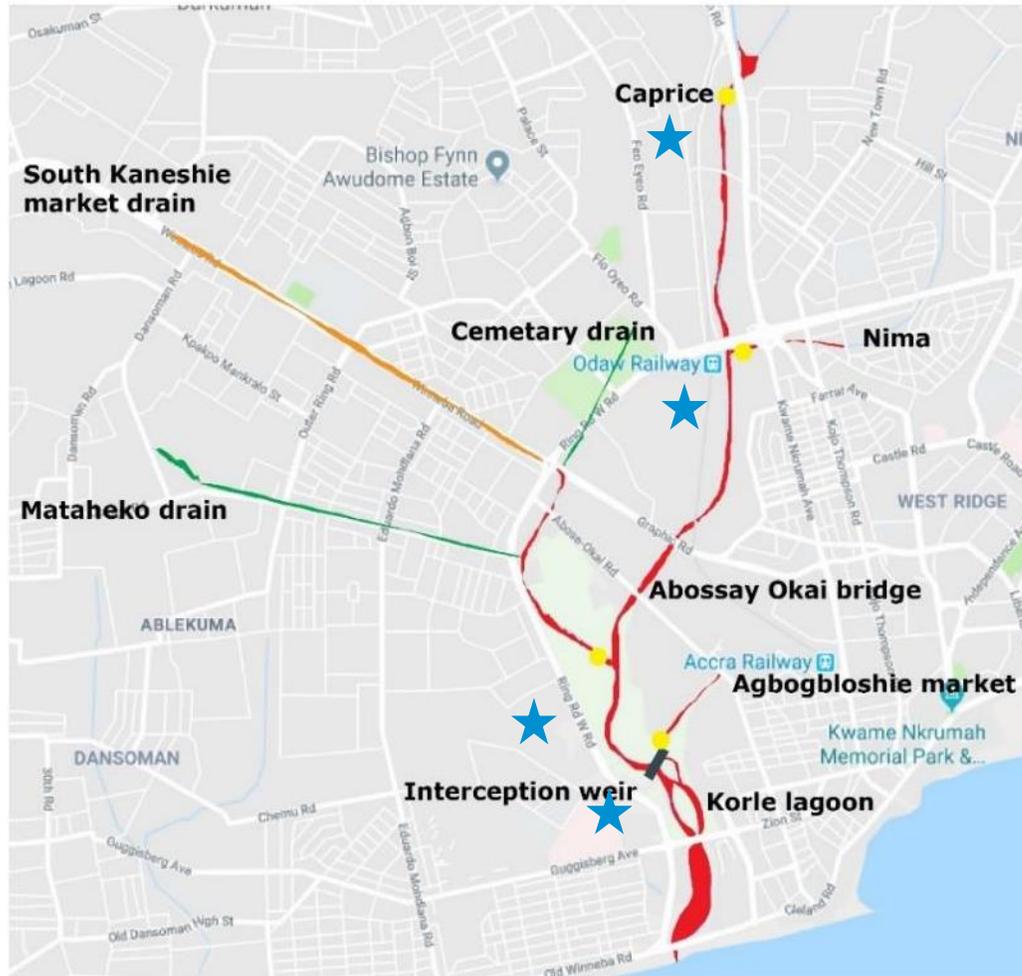
2. Conceptual design

- Conceptual sand trap design
- Effect assessment of (individual) sand traps and impact on dredging cost
- Investment cost calculation

**Concept design report
D3 Draft Feasibility Report**

**D3/D5
Draft/Final
Feasibility
Report**

Methodology – Task 4 – Assessment of sand trap locations



- Based on former projects (KLERP, Agbogbloshie dike construction, bank protection works Odaw, Haiti, ...)
- Based on the HKV pre-feasibility report (Greater Accra Climate Risk Mitigation Strategy)
- Upstream from tributary IF available space and when tributary bottom is already protected: ex. Caprice
- Downstream from tributary \Rightarrow tributary acts as sand trap basin
- Constraints:
 - Design discharge, frequency of occurrence (%)
 - Critical bottom velocity of sand/silt particles
 - Minimal dimensions vs. maximal flow velocity
 - Accessibility of the drain/tributary at the sand trap location
 - Bottom and slope protection
 - ...

Methodology – Task 5

1. Assessment weir

- Assessment of initial purpose and functioning weir
- Assessment of actual situation (non-functional) of the weir (present baseline)
- Analysis of previous documentation Operation & Maintenance

2. Assessment weir

- Use the output from the ongoing project to tie-in with the Performance Based Contracting of this new project

3. Assessment future situation

- Assessment of potential future scenarios (cleaning / rehabilitation) including the potential role of weir of the capture of plastic
- Concept designs (+ costs)
- Assessment on the re-use of plastic including a business case

D2 Interim Report

D3 Draft Feasibility Report

D5 Final Feasibility Report

Methodology – Task 5

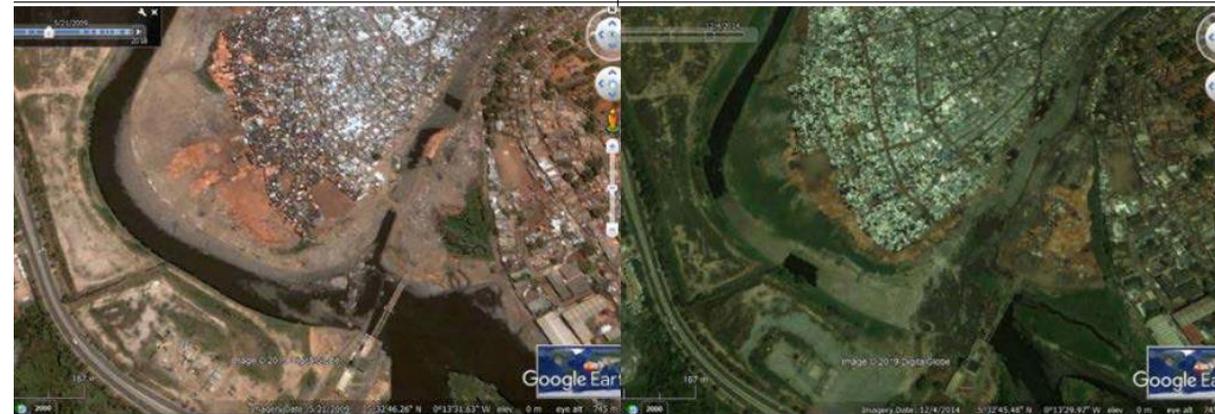
Assessment weir

1. initial purpose and functioning
2. actual situation (non-functional)



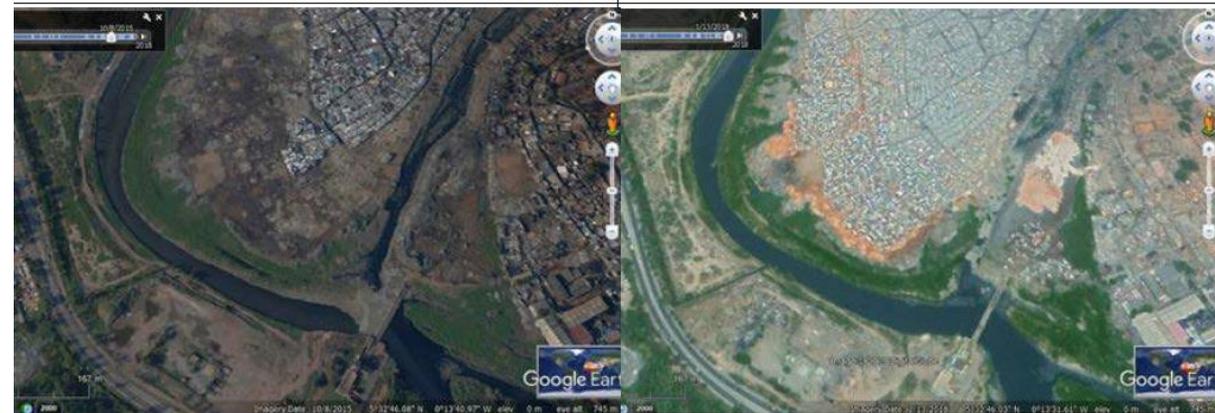
2000

2008



2009

2014



2015 (after flood)

2018

Methodology – Task 5

1. Future scenarios (ensure discharge & dredging)
2. Re-use of plastics

If the weir is cleaned, the following options will be checked:

- continued cleaning and functioning of the flap-gates as intended
- combining with a new bridge deck as additional connection over the lagoon and to ensure maintenance (cleaning) and opening of gates during flood
- Re-design of weir in relation to dredging (removal, part of the weir passable for dredging equipment, controllable gates instead of flap gates to influence water level upstream, etc.)



WASTE RECOVERY INNOVATION CHALLENGE !!!

Are you an entrepreneur or private sector firm with an innovative business idea for waste recovery in Ghana?

Enter our **Waste Recovery Challenge** and stand the chance of getting funding.

Details: <http://bit.ly/2UOicxm>

Deadline: 1st March 2019, 5pm GMT

UNDP

WASTE RECOVERY PLATFORM

UNDP Ghana Waste Recovery Innovation Challenge 2019 (up to \$40,000)



Methodology – Task 5

Business case re-use plastic aspects:

- Assumptions of quality and quantity of waste (plastic);
- The quality of plastic depends on the time the material has been exposed to UV-light, floating in the water and contaminated with other materials or chemicals. Separation of the different types of waste may be possible however if quality of plastic is low, it may not be suitable to recycle as regenerate product;
- Based on quality and quantity of plastic defining the potential re-use and / or destination of waste (recycling, thermic recycling, waste belt, etc.);
- Investment costs, operation and maintenance costs;
- Recommendations reg. re-use of plastic for 'high quality' regenerate, being collecting plastic as part of solid waste collection system. Avoidance of entering the drainage / river system is preferable for reasons of environment/ health, water management and re-use of plastic.



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WASTE RECOVERY PLATFORM

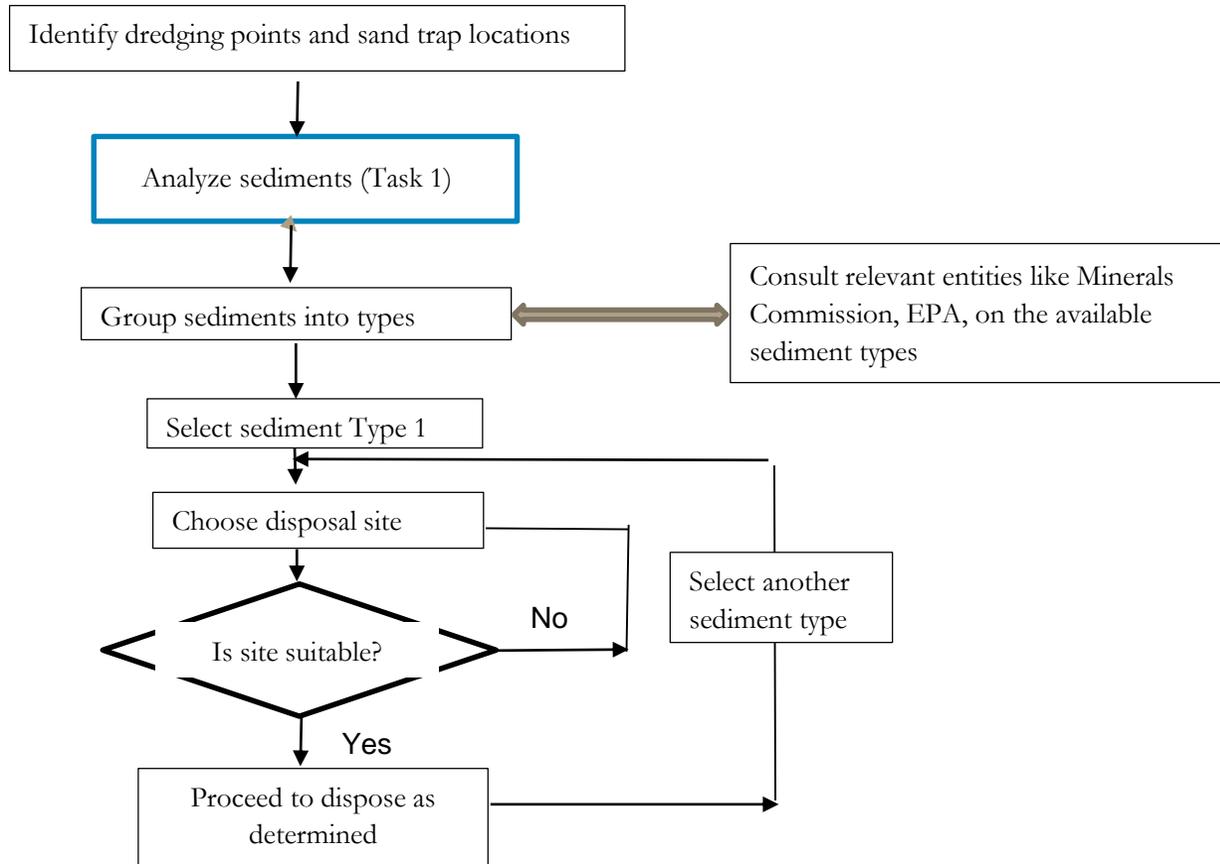
UNDP

UNDP Ghana Waste Recovery Innovation Challenge 2019 (up to \$40,000)



SUEZ, an expert in water and waste for 150 years, is fully engaged in the resource revolution

Methodology – Task 6: Institutional analysis



Methodology – Task 7 - PPP and joint venture possibilities and risks

1. PPP background study

- Desk study
 - Legal documents (PPP policy, PPP Law, Procurement Law)
 - International literature and project lessons
- Intake interviews
 - Relevant public institutions (jointly with task 6)
 - Selected potential private contractors (national and international)

2. PPP feasibility assessment of proposed technical solutions

- Financial feasibility (financial model)
- Risk analysis
- Contractibility of performance

3. PPP structuring

- Optimization and fine-tuning of PPP arrangement
 - Scope of PPP
 - Risk allocation and management
 - Payment mechanism
 - Performance standards and indicators
 - Government support and guarantees
- Financial analysis of PPP arrangement – for contractor and government (fiscal)
- Outline of PPP procurement and implementation plan
- Second round of private sector market sounding

D2 Interim Report

D3 Draft Feasibility Report

D5 Final Feasibility Report

Methodology – Task 8: Capacity building and training needs assessment

INFORMATION TO BE USED

- **Hydrological and Drainage Studies**
- **Collection of Background information & Desk Studies**
- **Watershed Data**
- **Hydrological Data**
- **Hydrogeological Data**

COMPONENTS

- Component 1: Drainage, Sewerage, and Flood Management Improvements,
- Component 2: Improvements in Solid Waste Management Capacity,
- Component 3: Support for Prioritized Informal Settlements, and
- Component 4: Strengthening Capacity for Planning, Coordination, Monitoring and Evaluation.

support for detailed engineering design with cost of drainage, sewerage and flood management infrastructure based on flood risk modelling results, improving flood plain, wetland and retention basin management, including land ownership, enforcement, operation and maintenance and all engineering activities under the project,

Our Approach

For the pre-feasibility stage of this assignment, we envision a coordinated approach involving design engineers, surveyors and other professionals where we would collectively review the proposed project components to provide basic information to the Ministry of Works and Housing,

We shall then identify groups that are to trained to coordinate the entire project

- Anticipated project activities would include, but not restricted to:
- Removal of plastic debris that choke up existing drains,
- Removal of water weeds and vegetation along stream corridors,
- Removal of some physical structures along the stream corridors to make way for drain construction/management activities and to enhance stream flow,
- Dredging and de-silting of the drains and water courses, and
- Widening and (re) construction and relining of drains if necessary.

Methodology – Task 9 - Preparation of bidding and tender documents

1. Draft bidding and tender documents

- Workshop on output specifications (performance standards and indicators)
- Choice of selection and market approach method
- Drafting of bidding and tender documents
 - Project information memo
 - Request for prequalification (RFQ)
 - Request for Proposals (RFP)
 - Draft PPP/PBC agreement
 - Output specifications
- Consultation with PIU and contracting authority (MWH) along the way, based on interim drafts

2. Final bidding and tender documents

- Revision of draft documents based on Reference Group comments
- Preparation of final bidding and tender documents

D5 Final Feasibility Report

D4 Draft PBC agreement and WB tender evaluation protocol

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Question & Answers
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