Terms of Reference – Engineering design to install and upgrade the Intermediate Sludge Transfer System (ISTS)

Background

According to the scale of the refugee influx and the speed at which displacement occurred, the need for clean and safe sanitation facilities has been a constant challenge. The breakneck speed at which the crisis unfolded meant that some emergency facilities were installed on a temporary basis, and fecal waste management has been a huge concern with high levels of diarrhoea, respiratory infections and skin diseases like scabies – all related to poor sanitation and hygiene. The density of the settlement and hilly terrain have also exacerbated the issue, as the ground is susceptible to landslides, flooding and erosion. The unplanned manner in which the camps sprang up meant that suitable land for latrine pits and fecal sludge treatment are in short supply.

Finding sustainable and affordable sanitation solutions is a priority for Oxfam and the WASH sector. Many people do not have access to a dignified, safe and appropriate toilet – leading to open defecation, public health risks, and protection issues. Meanwhile WASH sector came up with various unified latrine design where the latrine emptying and transportation is still a challenging issue to address due to the limitation of land, accessibility, transportation and appropriate treatment solution. Oxfam WASH team has identified and piloted a simple solution which known as Intermediate Sludge Transfer System (ISTS). The full system was developed organically during on set emergency period without proper engineering design. The main objectives of the system are to avoid any kind of manual sludge carrying but mechanical sludge pumping to the semi or centralized treatment system for keeping the camp environment safe to live by reducing public health risk.

It has been learnt a great deal from the ISTS trials at camp 3 and 4 under Ukhiya upazila in Cox's Bazar – but there are some optimization and orientationally shortfall for the current system which are needed to be identify provide a proper engineering upgradation plan with cost effective pumping system for the proper upgradation of the ISTS design and concepts. Considering the all kind of geophysical, political and social challenges and needs the assignment need to be carried out to provide an optimum solution in fecal sludge transportation link under full chain FSM system in the response.

Objectives

The main objectives of the system are to avoid any kind of manual sludge carrying but mechanical sludge pumping to the semi or centralized treatment system for keeping the camp environment safe to live by reducing public health risk.

- Come up with the engineering design and concept for ISTS which will be cost effective and durable to cover the long-distance sludge transfer for camp context specially the northern mega camps under UNHCR geographical area (annexure 1).
- To evaluate the appropriateness and effectives of piloted ISTS at camp 3 & 4 and proposed the efficient design and plan for upgrade the system to make it cost effective, durable and effective.

Methodology

- An international and national experts/consultant will be engaged to evaluate and an appropriate methodology will be proposed by the Consultant and agreed with Oxfam WASH team.

Deliverable

The expected deliverable from the assignment are highlighted in following;

- Evaluation on the current ISTS which is in operation presently at camp 3, 4, 4 Ext and 5 toward the Oxfam-UNHCR centralized treatment system.
- Considering the design capacity mapping the prospective coverage area beyond camp camp 3, 4, 4 Ext and 5 to what extend ISTS can be extended and provide the proper engineering design and pumping system
- Considering all the geophysical, political and social challenges provide the in-scale design, drawing for ISTS, coverage map for each system.
- Need to come up with the Faecal Sludge generation report with having some sampling data collection and secondary information.
- Conduct the proper geo physical survey for pipe line installation and mapping
- Prove proper engineering design and specification on solar and pumping system for sludge transfer.
- Illustrate the design criteria & guideline and provide the simplified worksheet/temple (in Excel) by making it user friendly for further design and upgrading.
- Simplified sludge pumping system, solar, mechanical or composite, in all level with proper specification and which are locally available.
- Provide an operation and maintenance manual in detail including the incidence coverage and possible response.
- Provide a simplified operational and monitoring guideline for latrine containments emptying to transfer network loading and then pumping through the system to treatment plant.
- Provide an estimated CapEx and OpEx for each network in terms of coverage area and population will be under served.
- Ensure the design and network has also been done in considering the disaster like, flood, cyclone and fire.
- In annexes, all the Excell, AutoCad, PDF, PPT, Word, mapping files like KML, shape files need to be given to Oxfam in electronic.
- Finding the limiting factors and recommending practical in implementation guidelines.
- Present the outcome form the assignment at the Sanitation Technical Working Group at WASH sector.

Timeline

10 Days	Before Arrival. 1. Oxfam CXB to provide all the available secondary data, situation report, maps, sector strategy etc for study and review. 2. Consultant will be proving a plan and programme for visit, including allocation of staff and vehicles to Oxfam to review and agree on. 3. Oxfam to plan and arrange all KII, FGDs and field visit.
5 days	Before departure 1. Consolidate information from other study documents on Intermediate Sludge Transfer System-ISTS technology.

	2. Read Oxfam and WASH Sector sanitation strategy documents. 3. Review the available Oxfam monitoring data and info about ISTS. 4. Agree with Oxfam on requirements for measuring, testing and evaluating of current system.
25 days	Field visit to Cox's Bazar 1. Orientation meeting with Oxfam, UNHCR and other WASH sector personnel: 1. Review of key needs, 2. Review of data 2. Monitoring visits to the available ISTS (including those of Oxfam, Practical Action, NGOF, MSF, Brac etc.) in different camps. 3. Field visit of the current and prospective FSM treatment sites of Oxfam, MSF, NGOF etc. 4. Field visit to see and understand the various types of latrine containments 5. Conduct KII in different stakeholder levels. 6. Data collection and analysis. **7. Desk work for drawing, design and draft development of expected deliverables** 8. Preparation of presentation on the recommendations according to the outline. 9. Discussion meeting with Oxfam personnel on primary findings and deliverable.
7 working days	After visit submission of report and draft peer reviewed paper as per expected out put
1 Working day	Organize presentation of the updated outcome of the ISTS at the San TWG. [Oxfam]

Costs

Financial proposal to be provided by the Consultant including technical proposal.

Skill and Competencies:

- Similar types of working experience on Sanitation arena speciality on Faecal sludge management and Waste water treatment system designing.
- At least 5 years' experience on water and sanitation engineering work
- Sewage and water Pipe line design and proven experience on implementation
- Expertise on solar and pumping design
- Proven experience to work with UNs and Oxfam will be given priority

Annexure:

1. operational_presence_map_-_wash_partners_-20_august_2019
   https://www.humanitarianresponse.info/en/operations/bangladesh/infographic/coxs-bazar-wash-sector-operational-presence-august-18-2019