

TERMS OF REFERENCE

Consultant to synthesize good practice and knowledge to treat municipal wastewater and sewage

(Activity 2 of Output 3.2.1 of AWP 2017)

Background and Justification

Based on the transboundary diagnostic analysis of the Yellow Sea, one of the major environmental problems is the enrichment of nutrients in the Yellow Sea which is the major cause of harmful algal blooms in the region. Water pollution in coastal areas has caused social and political attention because of its significant impacts on not only the environment, but also the economy and society as well. More importantly, water pollution issue has been intertwined with other issues such as coastal wetland loss, marine ecosystem degradation and coastal land reclamation, eutrophication from aquaculture, etc. Therefore, more cost-effective, innovative and integrated approaches rather than traditional engineering methods are needed to tackle water pollution in coastal areas under high development pressures in this rapidly changing time.

Manmade wetlands or use of wetland for tertiary treatment of pollution have been recognized as effective ways to remove nutrients and other pollutants from land-based sources in YS region by the PR China, RO Korea and international financial institutions such as the World Bank. Studies indicate that the constructed wetland's efficiency in water pollutants is reliable, particularly for nutrients removal with a very low wastewater background concentration, meaning it is suitable for the non-point source pollution.

In order to help local government design and invest in cost-effective and with spin-off effect of ecological services for public benefits, the project will conduct an assessment and review of good practices that can be applied across YSLME in particular in use of wetland regulatory services to treat wastewater and sewage. It is expected that this review will contribute to knowledge building in YSLME.

Objectives

The objective underlying the proposed consultancy is to catalyze investment in cost-effective and environmentally friendly pollution reduction from land-based sources through wetland restoration and construction to improve the ecosystem health of the Yellow Sea.

Immediate Objectives

The objectives underlying the proposed consultancy are:

1. to synthesize and document knowledge in using wetland as nutrient sinks for improving the ecosystem health of Yellow Sea for replication of good practices for investment

Expected Outputs

The subcontractor is expected to deliver the following results:

- 1) four case studies detailing the design, implementation modalities, results and services of wetland and species in removing nutrients from the projects, and cost-benefits of such projects;

- 2) an overview of technologies, cost-benefits, cost and effect and value of wetland services in restoring coastal and marine environment;

Activities

Under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team, the consultant will conduct the following activities.

- 1) Prepare a synthesis report of latest developments in using wetland as nutrient sinks to diversify approaches for coastal wetland restoration with amplified spinning effects
- 2) To select and agree on wetland restoration modalities, including 1) return fish ponds and salt-making ponds to bays and coastal marshes, such as Wuyuan Bay, Xiamen; 2) using wetland for tertiary treatment associated with Sewage treatment plants, such as Ningbo World Bank Project; 3) use species and aquaculture to achieve the co-benefits of sustainable harvest and environmental performance, such as intertidal shell fish farming in RO Korea; and 4) nutrient bioextraction in Long Island sound, New York
- 3) Prepare four case studies detailing the design in theory and practice, monitoring system, results and services of wetland and species in removing nutrients from the projects, and cost-benefits of such projects;
- 4) Document the investment modality for replication;

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will facilitate the access to information, reports, contacts and facilitate visits to project sites.

Timing

The consultancy will begin in October 20 and end in March 31, 2018.

Reporting

The subcontractor will produce draft synthesis report and case studies for review in December 10, and final report and case studies by March 31, 2018. All reports should be submitted in English. Reports should be submitted to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org.

Budget line

Budget line: 71200, Activity 2 of Output 3.2.1, ACTIVITY 3. Budget: 1447; Project ID: 91007.