

Consultancy Project -Environmental Studies Division

Project Title: Study on the Environmental Impacts to Marine Resources due to Lakvijaya Power Plant (Continuous Study ;2019-2020)

Project Proponent: Lakvijaya Power Plant, Ceylon Electricity Board

Duration: January 2019 to February 2020

Components:

- Marine Biological Survey- MBRD
- Water Quality and Toxicological Analysis- ESD
- Sediment Transport Analysis- NIOMS
- Temperature Data Measurements & Numerical Modeling of Thermal Effluent- NIOMS
- Bathymetric Survey- NHO
- Deliverables of the Project: Inception report, Interim report and Final report

Project Progress: Inception report and interim report were submitted.

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Project Leader- Ms. M. D.S.R. Maddumage

"Study on the Environmental Impacts to Marine Resources due to Lakvijaya Power Plant" is a consultancy project worth LKR 19,359,080.00 awarded to Environmental Studies Division in 2019 by the Lakvijaya power station, Ceylon Electricity Board. The study was initiated by the division at the request of Lakvijaya Power Plant to conduct a comprehensive survey of the area.

Several studies have revealed that the Lakvijaya coal power plant has a negative impact on the surrounding communities and the environment. The public's perception of this coal-fired power plant is not always favourable and people are more concerned about the negative impacts on human health as well as the livelihood. Although viable, highly effective technologies have been developed to tackle environmental challenges, the proper implementation and maintenance of such measures are questionable. Consequently the environmental damage from coal power plants is unavoidable. Therefore, the present study focused on the adverse impacts on marine resources due to the thermal pollution by the Lakvijaya power plant. The coastal ecosystem in the vicinity of the power plant was closely monitored through the present study in various aspects to identify the environmental damages due to thermal pollution.

This project is a collaborative project involving research studies from the Environmental Studies Division, Marine Biological Resources Division, National Institute of

Oceanography and Marine Sciences and the National Hydrology Office of NARA. Contribution of each division for the project is as follows.

Project Component	Responsible Division	Activity
Marine Biological Survey	MBRD	• Study of diversity and density of zooplankton and ichthyoplankton in the adjacent coastal area. • Study of ecology of pelagic organisms at selected locations. • Evaluating the changes in fish catches before and after the establishment of the power plant. • Underwater visual survey of reef habitats and jetty area
Water Quality and Toxicological Survey	ESD	• Identification of physico-chemical properties of coastal waters adjacent to the power plant. • Assessment of mobility of toxic substances from coal combustion in coastal water, sediment and fish/shellfish. • Study of diversity and density of phytoplankton and in the adjacent coastal area. • Study of diversity and abundance of benthos in adjacent coastal area.
Assessment of level of thermal stress on the adjacent coastal areas using Numerical Modelling & in-situ measurements	NIOMS	• Assessment of thermal stress in adjacent coastal areas generates by the power plant. • Assessment of thermal gradient around the discharge point. • Modeling the thermal plume dispersion and extent (in different seasons) • Modelling the vertical stratification of thermal effluent discharge (in different seasons) • Elucidating the thermal stress level at the Thalawila reef.
Numerical Modelling of Sediment	NIOMS	• Determination of sediment transport of Norochcholai power plant. • Analysis of sand movement pattern within the

Transport Analysis		project area, including the distribution of the shore covering both seasons. • Study of wind direction, details of wave heights and direction for given locations • Study of current pattern within the project area in low /high tide. • Identification of shoreline changes/coastal erosion and beach stability
Bathymetric Survey	NHO	• Study of bathymetry of the coastal area adjacent to the power plant.

The project deliverables are the Inception report, Interim report and Final report. We have already submitted the inception and interim reports of the project. Final report will be submitted in February 2020.



Cooling water outlet tank



Outlet culverts of the power plant



Coal Yard



Ash Yard



Sampling at Norochcholai

