

Shifting toward Resource Management in Remote Area: A Case Study of Lake Toba, Indonesia

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INTRODUCTION

Lake Toba in Sumatra, Indonesia is the largest volcanic lake in the world which has huge potential for the tourism industry due to its natural and cultural heritage (Akhmad, S., Imanuella, R. A., et al., 2015). In this context, the President of Indonesia pledged to accelerate the development of infrastructure to boost economic development by tourism for Lake Toba (Cabinet secretariat of Indonesia, 2019). However, similar to other regions in Indonesia, the Lake Toba region is also facing waste management issue besides the lack of infrastructure for tourism. Most solid waste from households and tourist accommodation is not properly managed, and leaks into the lake, which ruins the value of natural assets. In order to promote proper waste management in the region, the local waste management plans or strategies called *Kebijakan Strategi Daerah (Jakstrada)* at the regency level (*kabupaten*) have been developed based on the 3R (reduce, reuse and recycle) concept. In addition to the action plans, a pilot project on resource recovery centre (RRC) was set up as one of the strategic actions by the Ministry of Environment and Forestry (MoEF), the local municipalities in cooperation with IGES. This study presents the current status of waste management in the region, identifies the issues, and examines how waste management issues should be solved in rural or remote areas like the Toba region where basic waste management system is not established and major recycle value chains do not exist in the nearby areas.

METHODOLOGY

The study has taken the following steps to collect information and data:

- A literature review and desk study
- A waste survey as well as a series of workshops with local residents and local government officials were organised in partnership with MoEF, the IGES Centre Collaborating with UNEP on Environmental Technologies (CCET) and Institute of Technology, Bandung, during the period of June – October 2019.

RESULTS AND DISCUSSION

Current waste management in the Lake Toba region

Through the waste survey and field work in the region, the current situation is summarised in Table 1. It was revealed that the waste collection systems have not been established and covered all areas, which often results in illegal dumping and open burning by the waste generators.

Description	Regencies		
	Simalungun	Samosir	Toba Samosir
(1) Population	863,693 (2018)	146,978 (2018)	185,425 (2019)
(2) Estimated total waste generation	187,506 (t/year) (2019)	32,331(t/year) (2019)	27,614 (t/year) (2019)
(3) Estimated waste collection	18.3% of total waste generation	47.1% of total waste generation	37.1% of total waste generation
(4) Final disposal sites	One new landfill site was developed in 2020	One disposal site in the forest located far from the city center	Two final disposal sites

Table 1. Current situation of waste management

The waste management issues in the region

In addition to the lack of basic waste management services and practices in the region, it was revealed that one of the biggest constraints to understand the baseline data of waste generation was insufficient data management. In addition, although the RRC was installed as an instrument to initiate a local recycling scheme and trigger the behaviour changes of local residents, the RRC faced operation issues and financial shortage. Besides the some constraints for accessing the major recycle value chain in Medan which is the closest recycle market to the region, it was observed that the coordination among the main actors; the local government, the local communities and the private sector was not well-functioning, which resulted in failure to secure liable human and financial resources.

CONCLUSION

In remote areas in developing countries like the Toba region where there is no well-established recycling scheme or having difficulty accessing major recycle value chains, local communities' willingness to accept (WtA) the obligation to separate at source, deliver and sell waste might be lower than urban areas because those obligation may not secure additional incomes at a satisfactory level as there are less opportunities to enter the recycle markets. In such areas, the effectiveness of the recycle scheme including RRC should be measured through concrete indicators such as availability to the public, performance and profitability, and the scheme needs to be designed based on those indicators and also to be closely related with the local industries to create higher income and better environmental benefit in nearby local markets for encouraging local stakeholder's WtA.

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