Set-up of a Decision Support System to Support Sustainable Development of the Languna de Bay

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Laguna de Bay, one of the largest freshwater lakes (900 sq. km.) in SE Asia is connected to Manila Bay through the Pasig River. During the dry season, the lake water level may fall to a minimum elevation of 10.5 m (corresponding to mean sea level), leading to the intrusion of sea water. With this flow reversal also highly polluted water from the Metro Manila area is carried to the Lake.

Over recent decades, population expansion, deforestation, land conversion, urbanization, intense fisheries and industrialization have produced massive changes in the Laguna de Bay catchments area. The resulting problems include rapid siltation of the lake, eutrophication, inputs of toxics, flooding and loss of biodiversity.

Rational and systematic resolution of conflicting water use and water allocation interests is now urgently needed in order to ensure sustainable use of the water resources. With respect to the competing and conflicting pressures on the water resources, the Laguna Lake Development Authority (LLDA) needs to achieve comprehensive management and development of the area.

In view of these problems and needs, the Netherlands is funding a two-year project entitled 'Sustainable Development of the Laguna de Bay Environment'. Activities have included work on establishing an Integrated Water Resources Management Group within LLDA to stimulate efficient knowledge transfer and further capacity building. A tool has been developed to support decision-making at catchments level. This consists of an Arc View GIS-database linked to a state-of-the-art modeling suite, including hydrological and waste load models for the catchments area and a three-dimensional hydrodynamic and water quality model (Delft3D) linked to a habitat evaluation procedure for the Lake.

The project also focuses on technical studies relating to dredging, drinking water supply and infrastructure works. These will aim to produce technically and economically feasible solutions to water quantity and quality problems, which currently prevent the sustainable use of the lake. All solutions will take due account of the various uses and environmental values of the lake system. Possible solutions will be assessed and recommendations will be made on a number of matters, including the removal of sediments, the possible abstraction of drinking water, the implementation of all sorts of infrastructure works and the use of advanced Environmental Impact Assessment procedures.

The paper will demonstrate the different project achievements, focusing on the set-up and use of the decision support system to support sustainable development within the area and dealing with the complex interaction between the Laguna de Bay and Manila Bay and the associated conflicts of interest.