

ECO WATER SAFETY IN JAKARTA

Jakarta Bay is an urban coastal area which has a big risk of flooding. In Jakarta, inundation is the major hazard that leads to the loss of lives and damage, especially on the low lying area, alluvial plain area and coastal environment (Marfai et al. 2009, Aert et al. 2009). Structural mitigation measures have been constructed in a number of vulnerable areas, including drainage systems, pump stations and Floodway Rivers (Example Banjir Kanal). But still Jakarta has problems with floods; a study to the problems has been done. To solve this problem a solution has been made up.

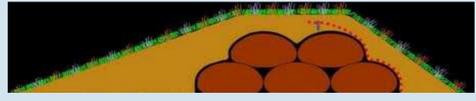
SOLUTION

To protect Jakarta Bay against flooding and tsunamis a giant dam will be built. Building a permanent dam is important, but the other aspects that must be considered are the environment of the ecosystem and social economic effects (fishery as an important source of income) of the construction of the dam on local communities around the bay.



The dam will be built from Geotubes filled with (polluted) soil from Jakarta bay. The Geotubes will be the base of the dam (Royal Ten Cate, 2010)

The Dam

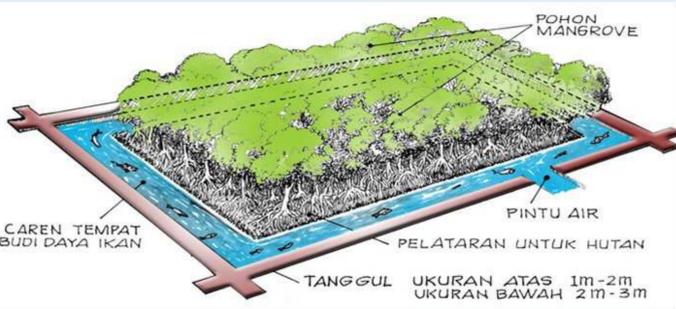


Jakarta has no working integrated public transport system. It is one of the reasons many people use private transport. A highway connection from east to west can reduce the pressure on the streets of Jakarta. Also the dam offers the possibility to construct a railroad, which can be especially useful for development of the Port of Jakarta on the sea side of the dam, in the Java Sea. This allows larger ships to load and unload in the Port of Jakarta, thus boosting the local economy (Institute SMO, 2008)



Mangroves

Mangroves are good for the ecology of the water, also fish like to live in near the mangroves. Also other ecosystems like coral reef, estuaries, etc. grow well in mangrove areas.



Mangrove for Silvofishery (source: Khakim, 2011)

Advantages :

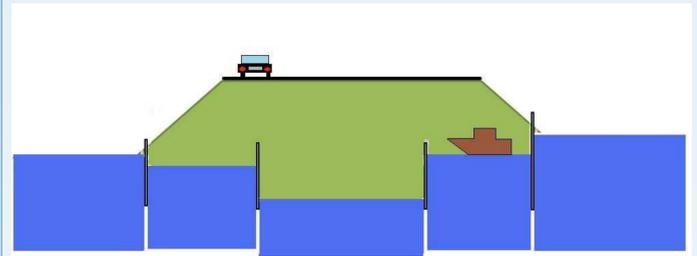
Absorb pollution, good quality of fish, energy source for biodiversity in the lake, etc.

Grow requirements:

Muddy beach (sea bay, estuaries, needs salinity (10 - 30 ‰ and 0 - 10 ‰) and has to be far away from high waves)

Sluice

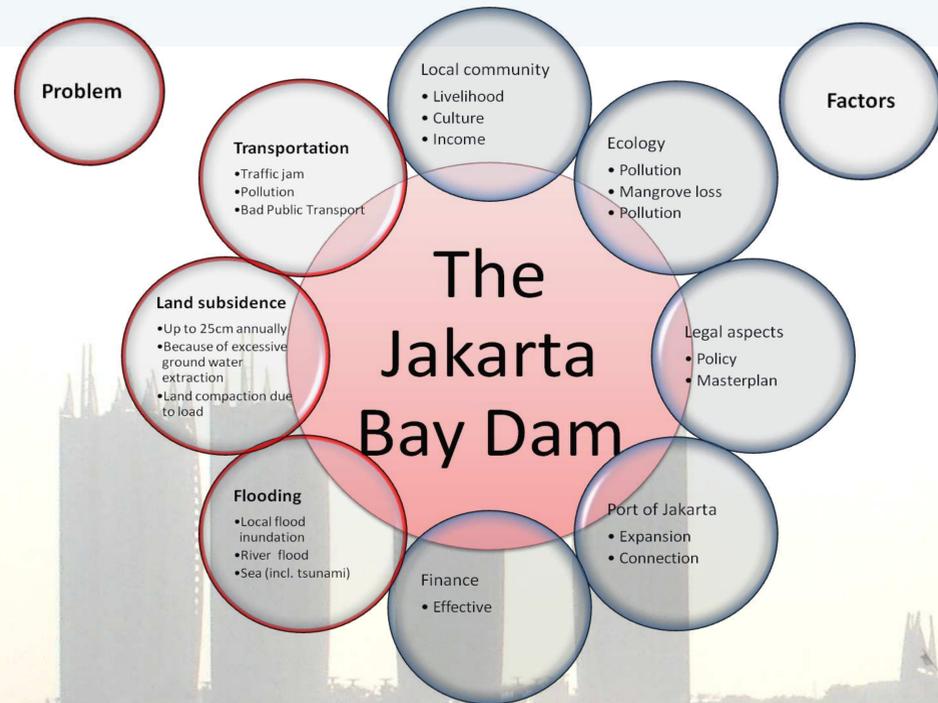
One of the (main) functions of the dam is to improve the connection between eastern and western Jakarta. To maintain the accessibility of the port of Jakarta a Stairs sluice will be constructed, so that the traffic on the dike will not be disrupted by a bridge.



Stair sluice (source: Koetsier et al, 2011)

PROBLEM DESCRIPTION

There are several problems occurring around Jakarta Bay. Plans of a giant dam are aimed to solve these problems. Several factors are needed to consider to make a good plan for the dam as a structural mitigation. The problem in Jakarta Bay consists of land subsidence, flooding, and transportation.



Problems

- **Land subsidence** in some parts of Jakarta is measured up to 25 cm annually. Land subsidence occurs because of several factors, which are excessive extraction of ground water and soil compaction due to over-load. The dam will protect the city from sea floods, thus making the effects of land subsidence less severe.
- Three kinds of **flooding** occur in Jakarta. They are local flood inundation, river flood, and sea/tidal flood. The building of a dam will decrease a risk of flooding from sea/tidal flood with a closed system.
- The **transportation** aspect is also a problem in Jakarta. The number of vehicles are more than the road's capacity, leading to traffic jams and worsened by a bad condition of public transport.

Factors

- **Local communities** are crucial in the creation of public support. The communities consist largely of fishing communities. The dam will inevitably influence them. By **involving the local communities** in the decision process and providing alternative livelihoods on time, the **communities will have options** and be prepared for the dam.
- In a **Legal Aspects**, government of DKI Jakarta has the plan to make a giant dam to prevent flood in coastal area of Jakarta. The additions described in this poster **fit in the already existing plans**.
- **Ecology** is a factor that is rarely considered in Jakarta. A dam of this size has a large impact on the (ecological) environment.
- The **Port of Jakarta** has important economical value. The realization of a railroad and road on the dam, will improve the **accessibility of the port**.
- Many decisions are based on **financial** aspects. This dam is expensive, but made as **effective** as possible. The government and local communities must be aware that the dam will protect the city and that will result in **reduction on infrastructural and physical damage**.

Wetskills Indonesia exchange program
16th november 2011



Fakultas Geografi
Universitas Gadjah Mada



Sepviana Rahmawati - UGM University
Annisa Triyanti - UGM University
Laurence Koetsier - Rotterdam University
Nikéh Booister - Rotterdam University

