

Technology Fact Sheet

Seawall and revetment technologyⁱ

1) Introduction

In every coastal area and beach in Indonesia, integrated coastal management will be applied. This is a process of coastal natural resource management and environmental services that integrate the activities of government, business and society covering horizontal and vertical planning, preserving land and marine ecosystems, application of science and management, so that this resource management will improve and be sustainable for the surrounding community welfare.

Lack of understanding of coastal dynamics will lead the efforts to harness the economic potential even bring up new problems such as erosion and abrasion as well as accretion. Besides, the incidence of sea level rise and tropical storms will also lead to coastal erosion. Various efforts to solve the problems through the development of Seawall and revetment have been and some are being done by government, business and the society. Because the incidence of abrasion and erosion of beaches are scattered throughout Indonesia, the location that has a significant impact will be followed up in advance. Development of Seawall and revetment is one of the appropriate adapt technology in dealing with further damage of coastal and beaches.

A) Feasibility of technology and operational necessities

Seawall and revetment are structures that were built on coastline as a barrier of the mainland on one side and waters on the other. The function of this structure is to protect and keep the coastline from waves and to hold the soil behind the seawall. The seawall is expected to cease erosion process.

On the north coast of Java, many cities are experiencing abrasion and erosion resulting from a decrease of land and sea-level rise. Actually those areas are potential as economic and tourism area. Land use in coastal areas is widely utilized as shrimp and fish ponds. With the incidence of abrasion and sea level rise, the damage of aquaculture infrastructure is very costly. Construction of seawall and revetment is needed in these areas.

The raw material to build Seawall and revetment is plentiful, as well as the field workers. However, the structure and strength of Seawall is still a problem, the existing building is not strong enough to hold the waves and movement of land, so that the lifetime of the building is not as initially expected.

B) Benefits of the seawall and revetment

Coastal protection strategy emphasizes on the complex variation of protecting the national assets in the coastal area covering from residential, commercial areas, agriculture to fisheries fields. The goals that are set for the coast should pay attention on the life, natural and artificial environment including land for a variety of prime activities.

Some of the functions of Seawall and revetment construction include:

- As the flood wall that serves as a protection / barrier from waves.
- Protection of wall of beaches from erosion
- Protecting the settlements, aquaculture and road infrastructure

2) Technical requirements

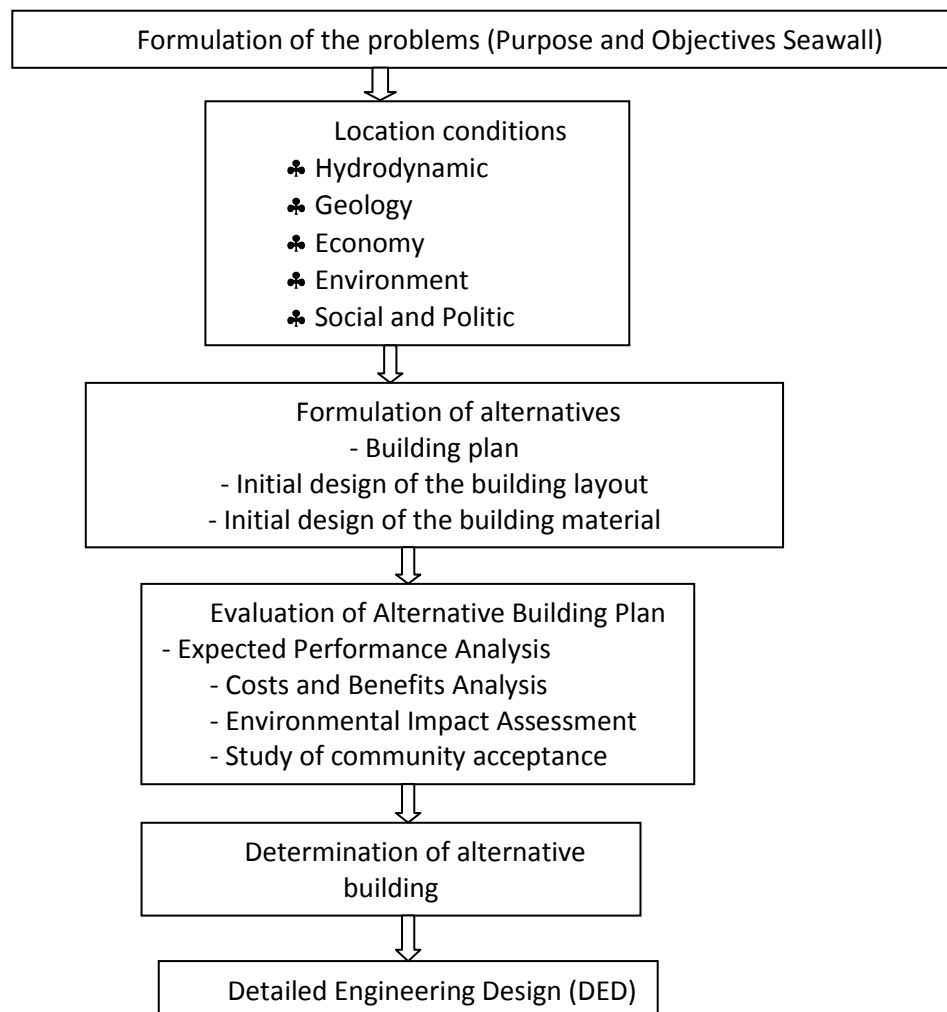
Good management of the coastline using one of its technologies, i.e. seawall and revetment will enhance the economic and environmental potencies along the coast, so it can be maximally utilized for the public interest. Diagram of the technical development to build seawall can be seen in the Figure 1.

3) Status of the technology and its future market potential

Seawall and revetment technology has been widely applied in coastal areas in Indonesia, but its existence is still lacking, because the damage process is faster than predicted while the need of many Seawalls and revetments is considerably urgent throughout Indonesia. The budget required should be planned on a regular basis and should be covered in the road map of the application of adaptive technology, especially coastal security with sustainable development policies and strategies.

The need for the appropriate Seawall and revetment technology suitable for a coastal area is of a huge potential market. In the presence of sea level rise and increasing the amount of waves in the waters, local government would anticipate from the incident. There have been many areas in Indonesia which suffered from damage due to the rising of sea levels, but until now there has been no initiative from local or central government in reducing disaster with Seawall and revetment construction.

Figure 1 Diagram of the determination process of the seawall or revetment to control the coastal damage



4) Contribution of the technology to protection of the environment

The availability of a seawall and revetment will reduce the environmental damage, such as damage to road infrastructure, aquaculture and even residential areas. Indeed, on one side seawall and revetment will reduce the damage from rising water level, but on the other side it will result in erosion of shore-line or in increasing sedimentation where there is no such construction especially at the end of the building. It necessitates a thorough and comprehensive solution with respect to coastal cells approach that is an approach where the beach is characterized as a system of a sediments input, transfer, storage and reduction. Seawall and revetment construction concept is using coastal cell by dividing the shore-lines into parts where its changes has no affects to adjacent section or who has a different character to the next sections.

5) Climate

Seawall and revetment technology is potentially used as a technological adaptation to coastal communities. It is not directly reduce the presence of carbon dioxide (CO₂), but the immediate benefit is felt by the surrounding community, such as reducing the damage of fish

or shrimp ponds, holding a deeper intrusion of sea water into the mainland so that the road infrastructure and housing are safer.

6) Financial requirements and costs

Construction of buildings on the coastal areas requires a substantial cost depending on the design, size and strength of the building. In the construction of Seawall or revetment, it requires a minimal of budget of about 3-5 billion Indonesian Dollars (ID) for a less extensive scale. The example is in the centre of Indonesia, at the Losari, Makassar, it takes a fund of 19 billion ID for the construction of such seawall.

ⁱ **This fact sheet has been extracted from TNA Report - Adaption for Indonesia. You can access the complete report from the TNA project website <http://tech-action.org/>**