

Technology Fact Sheet

Artificial Sand Dunes and Dune Rehabilitationⁱ

1) Technology description

- Artificial sand dunes simulate the function of natural dune ecosystems. Dune rehabilitation is considered as a mitigation technology to stop soil erosion, wind effects, storm surges and flood in coastal zones and an adaptation technology to climate change.
- Applied in a large scale in several countries such as the UK, or the USA, etc. In Vietnam, there have been some case studies on its ability to protect and rehabilitate Central Coast's sand dunes.

2) Socio-economic benefits

- It can be done with minimal capital costs as it relies on increasing sand supplement to natural direction of the dune or adjusting the height of or shaping the dune according to the development.

3) Environmental benefits

- A safe interface between the sea and the land, protecting coastal ecosystems and a sand storage.
- Conserving diverse, unique biodiversity and landscapes.
- Barely altering natural conditions or destroying original landscapes.

4) Status of technology

- In Vietnam, there have been some studies to protect and renovate the central coastal sand dunes.

5) Application potential

- Vietnam has four generations of dune: red (oldest, only in Ninh Thuan and north of Binh Thuan), saffron, white and grey (the youngest). The over development of shrimp farming and titan exploitation in sand dunes have destroyed large dunes across the coast, which take years to restore to the original state. Therefore, dune rehabilitation is very important.
- Less costly than other technologies, thus potential in seeking funds and community support.

6) Barriers

- Limited awareness of community or policy-makers.
- Asking for understanding of rules of local ecology and community.
- May affect the natural interaction process between seawater and beach.
- Causing conflicts between different purposes of usage.

7) Costs

Implementation technology application costs

Factors affecting the cost of building sand dunes are:

- The cost of building materials, sand recovery, or the cost of building fences or vegetation to promote the accumulation of sand to form dunes.
- The cost of moving building materials from the location on the shore or offshore to building place.
- The material, size and availability.
- Building fences for creating dunes to prevent erosion.
- Planting of vegetation to create.
- The number of additional artificial sand dune.
- Scope of the project and its economic efficiency.

Incremental costs to adapt to climate change (compared to conventional technology)

- The additional cost for breaking ecosystems, vegetation and material handling will increase when natural conditions become more severe due to climate change.

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