

Jetties

Challenge: Sea level rise

Adaptation response: Built infrastructure for shoreline protection

Description

Jetties are hard structures built at the banks of tidal inlets and river mouths to trap longshore sediment, thereby stabilizing the inlet or river mouth and preventing channel siltation. Jetties are solid and durable and are considered a hard-engineering protection measure.

Though jetties serve the same purpose as groynes they are different in that they are constructed at tidal inlets and river mouths, are typically larger, and also extend greater distances offshore (Davis Jr and Fitzgerald 2004). They are built to line the banks of tidal inlets or river mouths, aiming to stabilize one or both banks from shifting position and prevent large volumes of sand from filling the inlet/river mouth, thus maintaining an open and navigable channel. Jetties may also be used to prevent spit growth into a tidal inlet, thereby maintaining water exchange with the open sea, as well as commercial and recreational navigation.

Implementation

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Environmental Benefits

- Allows for a permanent and fixed opening of tidal inlets, ensuring water flow and navigation to back-barrier waters.
- Ensures predictable development in the morphology of tidal inlets and river mouths, which are normally dynamic and unstable features.

Socioeconomic Benefits

- Provides strong and reliable stabilization of tidal inlets or river mouths, controlling growth of that might interfere with the channel's opening to the sea. They can help realize more secure development by stabilizing tidal inlet and river mouth morphology.
- Provides a long-term solution to coastal protection in tidal inlets and river mouths.

Opportunities and Barriers

Opportunities:

- They maintain navigable shipping channels to inland areas. As such, their construction can yield benefits for shipping, commerce, industry and trade

Barriers:

- They can be very long, trapping very large sediment amounts of sediment their up-drift side. This can lead to major coastline erosion on the down-drift side
- To address the sediment starvation issue, it may be necessary to combine jetty construction with a sediment bypass scheme, where sediment trapped by the jetty is dredged from its up-drift side and deposited on the tidal inlet or river mouth down-drift side
- As jetties are long-lasting structures that have a great impact on the natural coastal environment, it is very important to ensure proper prioritization in the design process

Implementation considerations*

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|---------------------------|-----|
| Technological maturity: | 4-5 |
| Initial investment: | 4-5 |
| Operational costs: | 2-5 |
| Implementation timeframe: | 2-4 |

* This adaptation technology brief includes a general assessment of four dimensions relating to implementation of the technology. It represents an indicative assessment scale of 1-5 as follows:

Technological maturity: 1 - in early stages of research and development, to 5 – fully mature and widely used

Initial investment: 1 – very low cost, to 5 – very high cost investment needed to implement technology

Operational costs: 1 – very low/no cost, to 5 – very high costs of operation and maintenance

Implementation timeframe: 1 – very quick to implement and reach desired capacity, to 5 – significant time investments needed to establish and/or reach full capacity

This assessment is to be used as an indication only and is to be seen as relative to the other technologies included in this guide. More specific costs and timelines are to be identified as relevant for the specific technology and geography.



Sources and further information

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