



# Coastal Reconstruction in Front of Mining: International Perspectives and Fundamental Results

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## DESCRIPTION

Coastal mining activities, while economically beneficial, often lead to significant environmental degradation. The extraction of minerals and resources from coastal and marine environments can result in habitat destruction, water quality deterioration and the disruption of ecosystems. To address these challenges, post-mining rehabilitation is significant for restoring coastal areas to a stable, sustainable state. Analyzing global case studies provides valuable insights into effective rehabilitation strategies and the lessons learned from past experiences.

### The tin mining legacy

Indonesia's Bangka and Belitung Islands have long been known for their rich tin deposits, which have been extensively mined for decades. The environmental consequences of tin mining have been severe, including the destruction of coral reefs, mangrove forests and seagrass beds. These ecosystems are vital for supporting marine biodiversity and the livelihoods of local communities.

Rehabilitation efforts in Indonesia have shown that involving local communities in restoration projects is essential. Community participation ensures that rehabilitation activities align with local needs and knowledge, encouraging long-term stewardship of restored areas.

Replanting mangroves and restoring seagrass beds have been effective in rehabilitating degraded areas. However, these efforts must be carefully planned to consider the specific ecological requirements of the region, such as species selection and planting techniques.

Providing alternative livelihoods for communities that relied on mining is significant. Eco-tourism and sustainable aquaculture have been promoted as viable options, reducing the pressure on natural resources and contributing to economic resilience.

### Heavy mineral mining

In Australia, heavy mineral mining along the east coast, particularly in New South Wales and Queensland, has had significant environmental impacts. Mining activities have disrupted coastal dunes, wetlands and marine ecosystems, leading to erosion, loss of biodiversity and changes in water quality.

In Australia, successful rehabilitation has often involved integrated management approaches that consider the entire landscape, including coastal and inland areas. This holistic approach helps address the interconnected impacts of mining on the environment.

Rehabilitation efforts have prioritized the use of native plant species in dune and wetland restoration. Native plants are better adapted to local conditions and provide habitat for native wildlife, enhancing the ecological stability of restored areas.

Continuous monitoring of restored areas is essential to ensure the success of rehabilitation efforts. In Australia, long-term monitoring programs have been implemented to track the recovery of ecosystems and make necessary adjustments to management practices.

The Mekong Delta, one of the most productive agricultural regions in the world, has been heavily impacted by sand mining. The removal of sand from rivers and coastal areas has led to severe erosion, the loss of agricultural land and the degradation of vital habitats.

In the Mekong Delta, the use of erosion control measures, such as sediment traps and the restoration of riverbanks with vegetation, has been significant in stabilizing the landscape and preventing further degradation.

Efforts to restore natural water flow patterns have been lead to rehabilitating the Mekong Delta. Reconnecting rivers with their floodplains and restoring wetlands has helped improve water quality and support biodiversity.

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Stronger regulations and enforcement have been necessary to control illegal sand mining and ensure that rehabilitation efforts are not undermined by ongoing extraction activities. Collaborative efforts between governments, NGOs and local communities have been critical in implementing these policies.

Global case studies in post-mining coastal rehabilitation offer valuable lessons for restoring degraded environments and it leads to include the importance of community involvement, the

use of native species, integrated management approaches and long-term monitoring. Additionally, addressing the root causes of degradation, such as illegal mining, through policy and regulation is significant for the success of rehabilitation efforts. By applying these lessons, perspective rehabilitation projects can achieve more sustainable outcomes, ensuring that coastal ecosystems are restored to their natural functions and continue to provide essential services to both nature and people.