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ESIA for port development – in South Africa

Expansion of the Port of Durban

Type of impact assessment	Mandatory Environmental (and Social) Impact Assessment (ESIA)
Type of project/plan	Port development
Climate change related issues	Significant inundation, more frequent and intense storm surge, increased GHG emissions
Influence of the ESIA	Design adapted to meet expected climate change effects; improved environmental management plan

The revised ESIA for expansion of the Port of Durban included a climate change impact report. As a result, a higher quay was designed to meet expected sea level rise. The environmental management plan was also improved: it now includes specific climate change effects, as prescribed by new legislation.

Climate change in eThekweni

The Port of Durban is situated in the eThekweni Metropolitan Municipality

(EMM), in the urban centre of the region. It knows a warm maritime climate with an average temperature

of 16°C in winter and 27°C in summer, and 1054 mm rainfall per year.

Approximately 1.3 million people live in the urban centre where the Port of Durban is located. Moreover, 56% of the EMM's total GDP stems from this area. It is the economic hub of the EMM and of great importance to the local and South African economy. The Port of Durban itself is considered the primary gateway port to South Africa. Port expansion is needed since the country's economy is growing and freight volumes increase. Without expansion, South Africa's economic growth will be constrained, as the port's influx grows three times faster than national GDP. The current capacity is expected to be maxed out in 2019. Moreover, the port's safety standards cannot be met due to increased vessel size and a rising sea level.

Climate change affects South Africa, but the effects differ per region. At the country's east coast, where the port is located, the annual sea level rise is highest. On average, the sea level is rising by 2.74 millimetres per year compared to 1.87 and 1.47 millimetres per year at the west and south coast respectively.

It is also expected that the Port of Durban will be subject to more frequent and more intense storm surges. It is therefore needed that the design of the port is adapted to these changing circumstances.

Assessing climate change risks for the port expansion

A special climate change impact report has been drafted for the revised ESIA of the Port of Durban expansion, after the first ESIA was rejected because climate change impacts were insufficiently addressed. Climate change risks were addressed through literature studies on long term sea level rise, storm surge, temperature increase, wind increase, currents, waves, rainfall and ocean acidification in the EMM. The special report also takes into account the increasing GHG emissions that will be caused by the port's expansion. GHG emissions were calculated for three scenarios. These were then evaluated and compared with South Africa's national and international GHG policies.

Climate smart alternatives in the ESIA

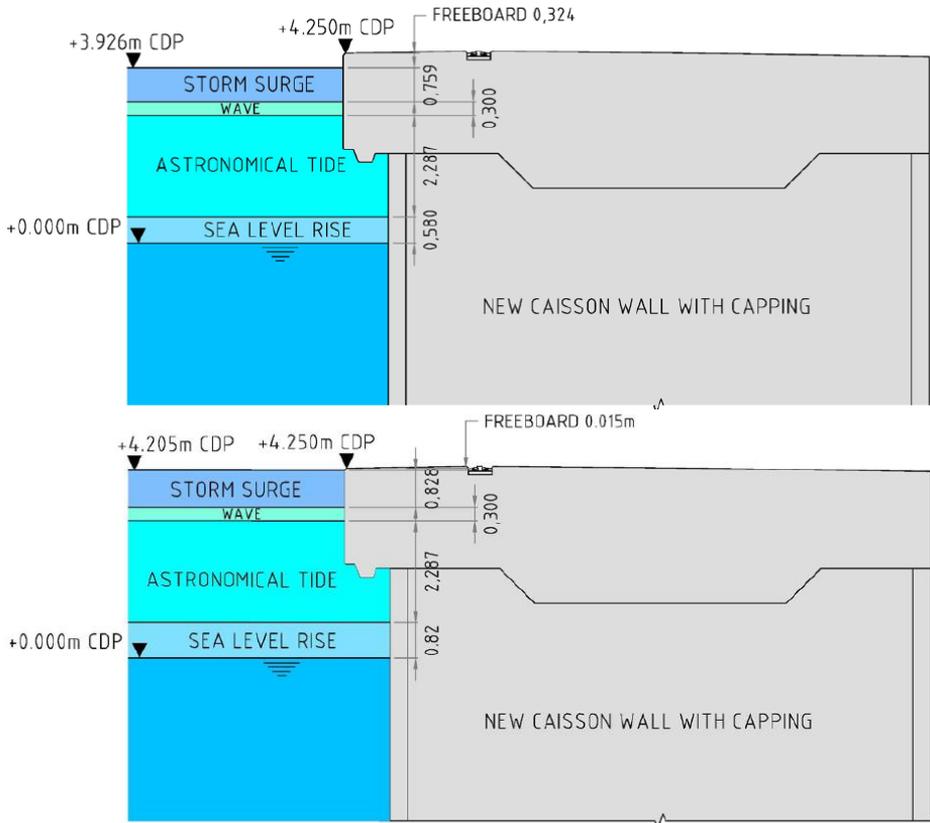
The overall conclusion of the revised ESIA was that the port's expansion



was designed without considering climate change criteria and did not meet climate change requirements. It therefore recommended to make some changes to the initial design. For example, it was recommended that the existing quay should be made higher. This should make the expansion of the port more durable. It was thought that the existing quay

did not provide sufficient protection against a rising sea, nor did any of the proposed alternatives.

It was also recommended to develop an environmental management plan to cope with heavier rainfall and winds. The plan should be adapted to include 10% more erratic rainfall and 5% faster overall wind speeds.



Changed design due to the ESIA takes into account climate change expected for the years 2069 (top) and 2100 (bottom)

Moreover, GHG mitigation measures were recommended, including the expansion of rail freight for container transport. This would be more sustainable than the truck transportation proposed by the project.

Conclusion: Climate smart design of the port expansion

As a result of the revised ESIA and the climate change impact report, the port's quay was made 0.5 metres higher to protect the area to a (temporary) sea level rise of 4.5 meter. The new Port of Durban can withstand sea level changes of up to 6 metres. This should make it last for the proposed lifetime of 50 years.

An environmental management plan has also been developed in response to the ESIA. The plan meets new legislation that prescribes incorporating heavier rainfall and winds in management plans. Transportation modes have so far not been adapted.

References

Brueton et al., Proposed Deepening, Lengthening and Widening of Berth 203 to 205, Pier 2, Container Terminal, Port of Durban: Draft EIA Report, Nemaï Consulting, Durban (South Africa), 2013.

Characteristics of climate smart(er) project:

- Three-step approach applied ✓
- Climate smart(er) project design ✓
- ESIA increased commitment for project ✓

Climate smart(er) because:

- Design has been changed to withstand sea level rise.
- Environmental management plan also addresses an increase in erratic rainfall and storm surges.

Naido et al., Proposed Deepening, Lengthening and Widening of Berth 203 to 205, Pier 2, Container Terminal, Port of Durban: Amended EIA Report, Nemaï Consulting, Durban (South Africa), 2014.