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## SEA for a land use plan in Kenya

### Land use plan for the Tana River Delta

Type of impact assessment	Voluntary Strategic Environmental Assessment (SEA)
Type of project/plan	Land Use Plan (spatial rural planning)
Climate change related issues	Increase in excessive floods, increased periods of drought, food insecurity, social unrest
Influence of the SEA	Zoning of the area according to expected climate change effects, with corresponding adaptation measures

**One of the climate change effects in Kenya's Tana Delta is increased flooding. The SEA for a land use plan on the area led to a distinction between low, flood-prone areas and high, safer areas. Measures were taken according to this distinction, to increase the population's safety and secure their livelihoods.**

#### Climate change in the Delta

The Tana River Delta lies at the end of Kenya's longest and largest river

and is located in the dry zone with an annual precipitation of about 600 millimetres per year. The availability

of water from the Tana River is one of the most important drivers for the regional economy. In the dry season the river discharge is low, and during the wet season floods occur.

About 100,000 permanent residents inhabit the area and make a living as farmers, fishermen or pastoralists. At the end of the dry season the area is also used for grazing and watering by pastoralists from outside of the area. The area is rather isolated from the rest of the country due to poor infrastructure and it is an important area for biodiversity.

The availability of water is under pressure because of climate change. It is considered one of the major drivers of environmental and social problems, such as food insecurity and conflicts over scarce resources.

Furthermore, climate modelling predicts an increase in exceptional flood events because total rainfall will increase and become more erratic. Since the population in the area is expected to increase, the impacts of these floods will be higher, affecting more people. Increasing evapotranspiration, on the other hand, puts pressure on the overall water quantity. Decreasing water



availability is further strengthened by an increased demand for fresh water, although climate change is one of the main drivers. This combination will lead to future water scarcities that have already led to social conflicts.

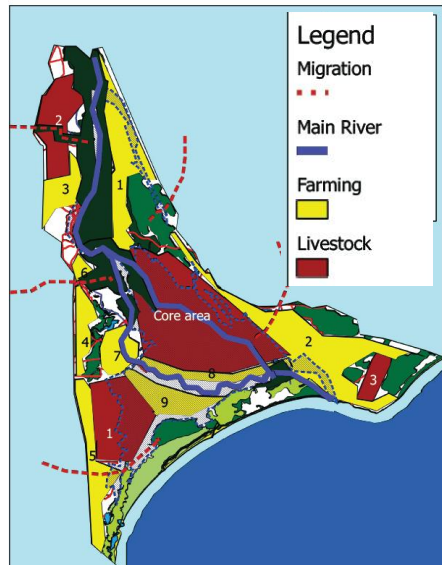
The Tana River Delta Land Use Plan aims to address, among others, these social and environmental conflicts.

### Assessing climate change risks for the Land Use Plan

The SEA on the Land Use Plan incorporates Google Earth ground level heights and extrapolates these to identify areas prone to flooding. In the SEA it is concluded that further research on climate change in the Tana River Delta is lacking but necessary. The use of Google information is a first step towards incorporating climate change impacts in strategic plans for the area.

### Climate smart alternatives in the SEA

The incorporation of climate change in the SEA has led to measures that should make the local population less vulnerable to climatic changes. A major contribution of the SEA is



One of three alternatives in the SEA

that it shows the minimum water flow that is needed to support basic livelihood needs.

The SEA further recommends to limit population growth in the area to stay within environmental thresholds. Settlements should be moved to areas outside the floodplain to make the people living there less vulnerable to floods. The SEA therefore suggests that the Land Use Plan should include measures that discourage people from living in areas exposed to maximum flood risk. Moreover, grazing of livestock from people living outside of the delta

should be minimized due to the expected increase of droughts. Also planned sugarcane production should not be allowed to grow, as it will cause an even greater pressure on water availability in the future.

### Conclusion: Climate smart design of Tana River Delta Land Use Plan

The SEA provided for an overview of the environmental and social impacts of the planned policies in the Land Use Plan. Several of these have been incorporated in the eventual plan for the Tana River Delta.

The eventual Land Use Plan distinguishes two areas: a higher area used for settlements and a lower floodplains area. The floodplains are used for tourism, area conservation, and a limited amount of livestock grazing. This should ensure a safe and liveable place where people are less exposed to climate change issues such as droughts and floods.

### References

Odhengo et al., Land Use Plan for the Tana River Delta, the Tana River and Lamu County Governments, Hola (Kenia), 2014.

Odhengo et al., Tana River Delta: Strategic Environmental Assessment, the Tana River and Lamu County Governments, Hola (Kenia), 2014.

### Characteristics of climate smart(er) plan:

- Three-step approach applied ✓
- Climate smart(er) plan design ✓
- SEA increased commitment for plan ✓

### Climate smart(er) because:

- Delta area is divided into two zones, reflecting climate change vulnerability.
- Measures will be taken to encourage people to live in the less vulnerable areas.
- The vulnerable area is assigned for grazing and biodiversity protection.