

## Before the Ocean Rises

### It is time for us to prepare ourselves for the rise of the sea level – on the local and national basis

***The sea around us will begin to rise as a result of the climate changes - most experts agree on this. When it happens, it will affect nature as well as agriculture, housing, and other facilities near our coasts. Within the local and the regional authorities the planning and the initiatives that make allowance for the rise of the sea level hardly exist despite the extent of its consequences. Today already, local authorities with a coastline in their area ought to include a rise of the sea level in their planning, and they would benefit from involving the local interests of the existing associations of house owners, farmers, fishermen, and nature organisations. Besides national monitoring, further information and demands on an increased planning are needed too.***

Now is the time to prepare for the rise of the seas as a result of the climate changes. The sea level around Denmark will rise probably about 50 centimetres during the next hundred years. It implies that the geography of the country will change. We will experience how the sea claims land from low areas and how the areas along the streams will be flooded more frequently.

Though the rise in the sea level is not expected to appear clearly during the first years, it is essential to map out the most exposed areas and to assess areas with tangible assets like infrastructure, housing and industrial facilities. Large trade and industrial enterprises must be able to plan on long-term perspectives for investment in buildings and production equipment to be profitable. Public planning within state, regional and local authorities are expected to be based on an even longer time perspective, because the expenditures are nearly insurmountable if you have to move railroads, harbours, roads, sewerage, hospitals, schools, or homes for those who require full-time care. Therefore it is important to include the sea level in the future planning in areas near coasts or fjords.

### More Speed on Planning

170 municipalities in Denmark have a coastline, and a great many of the low areas with natural resorts, agricultural areas, housing and summer cottage areas will be flooded in the future. Only few have initiated plans to make allowance for the future, increased sea level - among these are the Danish Coastal Authority, port authorities, some insurance companies and some local authorities. But many local authorities and officers, mortgage-credit institutions, farmers' unions, house owners' associations, summer cottage owners, business companies and tourist industries have not yet initiated a change in their planning for the reduced and altered territories.

The Jutland Wadden Sea has 107 kilometres of dikes that must be enforced and enlarged in due time. Streams with outfalls through the dikes will be more difficult to drain because of the outside pressure from the sea and the inside pressure from the rising subsoil water, and because of another result from global warming: a larger

amount of rainfall during winter. At the Jutland Wadden Sea a bigger pump capacity must be established together with areas for monitored flooding to prevent breach of the dikes.

Hence it is essential to map exposed areas along the Danish coasts and assess their socio-economic value to make a qualified basis on which we can decide if it will be worth it to maintain them in the long run. In Denmark a lot of houses in the coastal city - and summer cottage areas are situated in low areas and only few of them have bases originally constructed to be under water frequently. In many places the sewerage systems will cause problems too, when the sea level rises and the subsoil water rises with it in the coastal areas.

Animals and plants depend on beach- and coastal areas with tidal water. The Jutland Wadden Sea is for instance a valuable food and resting-place for migratory birds, when they travel from African wintering grounds to breeding grounds in the northern parts of Europe. Its present coastline consists of dikes, which stop the water, so at a higher sea level the tidal flats outside the dikes will be covered by water all the time in the future. There are no alternatives for the birds in the area, and there are no plans or decisions made to lay out new areas for them. It is an open question in other areas too, whether to let present meadows or low water areas spread further into the country concurrently with the rising sea level, at the expense of for instance farmland.

### **Different Interests**

Thus, in the nearest future a lot of assessments and considerations of pros and cons must be made concerning the different social groups and the different types of land. More water means less land, and we ought to begin the discussion about the allocation of the land, which will be left. The debate about the greenhouse gases takes place mostly between experts, but the question about how to react to the sea level rise are presumably better and more viably resolved by the citizens in the areas, that will be affected. Are low situated summer cottages, building sites, industrial plants and farm land to be maintained, or do we want nature and the sea to reign - and if so, how is this return to nature going to take place? How do we ensure that new facilities and the improvements on the old ones will make allowance for the climate changes, and how do we ensure that the costs connected to the sea level rise will be fairly allocated?

If we begin the planning now, potential conflicts between for instance the interests of nature preservation and agriculture might be prevented, and it will be easier to distribute the costs in connection with for instance summer cottage areas between the owners, the local authorities and the state.

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