



Adapt or else

by Petra Sörman, *Environmental and Sustainability Strategist, WSP Sweden*

The increasing temperature of the atmosphere causes the temperature of the sea to grow. As a consequence, sea levels are rising. By the end of this century, the sea will be one meter above the current point. Many areas in the world are already negatively affected by the climate change. Several islands in the Pacific have been claimed by sea-level rise, while parts of Miami, New York, and New Jersey are chronically flooded. One thing for sure, with time, seaports, including in the Baltic, will be more and more subjected to this new pressure, along with other extreme weather phenomena. How can we then make our ports resilient to climate change?

The greenhouse effect is something we have all heard of. What some may not know is the fact that without it Earth would not be habitable. However, there's a widely accepted consensus now that our planet's natural pattern of temperature fluctuations has been derailed by human activities, specifically the over-the-top use of fossil fuels to power the economy since the Industrial Revolution. Transportation, the scale and the way we produce our food, vast deforestation, etc. – all that bound together releases large

amounts of greenhouse gasses into the atmosphere annually. The changes due to rising temperatures are: increased intensity of rainfall, rising levels of both sea and groundwater, increased intensity of storms, and heat waves. All of them negatively impact the port industry.

Sink or swim

Regular floods cause damage to buildings, roads, goods, and equipment. They halt or impair operations, disturb traffic, pose a risk to health and life of employees, etc. As far as ports are concerned, recurrent severe flooding harm their reputation.

After all, who would like to cut deals with a business partner who cannot guarantee swift, undisturbed, and safe cargo handling and storing? Climate change may not be your fault, but it's up to you to deal with it – for your and your clients' sake.

What's more, insurance companies are starting to discuss seriously whether it's still viable to indemnify coastal areas. They can also put a premium on top of what used to be the standard price, forcing ports and terminal operators to react accordingly (or risk a lone struggle). In fact, in some places, insurance companies have stopped insuring against flood

How ports can mitigate climate change risks

risks, until the port has been climate-adapted. While these companies fully acknowledge that they have an obligation to provide insurance against unforeseen events, floods are nevertheless no longer considered by them to be that sort of incidents. All because of the permanent rise in sea levels and the fact that the return-period between floods has decreased. As a consequence, when insurance companies choose not to insure certain areas, it causes the market to decrease. Customers are shifting their activities either to other and more safe ports, or opt for another transport mode altogether.

It is very important that port managers, employees, and other stakeholders understand the risks and consequences posed by climate change. These will be different depending on local conditions, and the answer to how exactly your port can be affected – but maybe more importantly to what extent extreme and/or recurring weather events will impinge your operations (Tab. 1) – this can be investigated by modelling future sea levels in the context of your surrounding environment, existing infrastructure and superstructure, etc. In other words, one should undergo a risk assessment specifically focused on climate change. Afterwards, if the assessment says, “Yes, there’s a high probability that your port will be subjected to A, B, and C climate change-induced events which will in turn have such-and-such deteriorating impact on your business,” then you should take proper countermeasures in order for your port to swim rather than sink.

Find your footing

In essence, climate adaptation is about upgrading the existing buildings, infrastructure, and port machinery to make them sufficiently resilient. It is also about ensuring that new construction takes place in a safe and sustainable way, and resisting to the greatest possible extent the negative effects climate change might bring about in the future.

Implementing a climate adaptation programme may involve several different measures. The most well-known adaptation measures include building walls, levelling up the ground, or installing sluice ports. But there are plenty of other options. For instance, in places where storms are expected to become more frequent, you can invest in cranes that safely operate during stronger wind gusts. It’s also wise to expand on-site renewable and low emission energy

Tab. 1. Climate risks and consequences regarding ports

Climate variable	Consequences
 Increased sea level and intensity of rainfall	<ul style="list-style-type: none"> Capacity overload of the drainage system may lead to flooding and consequently erosion of road, railway foundations, pollution, flooding of stacking and stockpiling yards, and disruption of road access Extreme flooding could lead to loss of radar and radio equipment Damage to storage buildings and goods due to flooding Economic consequences when businesses have to close until the buildings and areas have been restored
 Increased intensity of storm surge	<ul style="list-style-type: none"> Increased wave action at waterfront structures and consequently an increase in overtopping rates, hence flooding of berth facilities Beach erosion
 Increased intensity of storms	<ul style="list-style-type: none"> Closure of linked modes of transport, affecting supply and distribution of goods to and from the ports Toppling of containers in stacking yards
 Heat waves	<ul style="list-style-type: none"> Higher risk of rail track buckling (stressing) Higher deterioration rates of pavements and roadways Higher energy consumption of refrigerated containers
 High speed wind	<ul style="list-style-type: none"> Damage to navigation and communication equipment Delays/stoppages to unloading/loading vessels Damage to older buildings and warehouses
 Other	<ul style="list-style-type: none"> Reputation of a port operator can be damaged in the aftermath of a severe weather incident Insurance premiums may rise due to growing global losses from weather-related incidents

generation to avoid risks associated with power disruption and increased costs of energy, as well as to meet environmental legislative requirements. Additionally, it’s highly advisable to protect electrical outlets and other important features of the power system from flooding. Next, you can upgrade and adapt your storage facilities to accommodate more extreme events, making sure that the most valuable shipments are placed in a low risk area. Roads and railways within the port may need to be raised to provide uninterrupted traffic once flooding hits. You can also ensure that climate change allowances are included in the future design specifications, including accommodating future rainfall requirements into new building designs and incorporating sea level rise and storm surge into all port infrastructure elements. Working in partnership with other ports, city governments, and supply chain logistics infrastructure providers is vital, so as to appropriately plan and design connected logistic hubs that are resilient to the adverse impacts of climate change. Nevertheless, some risks cannot be mitigated. In these cases, the risk may need to be outsourced to a third party through insurance. Last but not least, please remember that before implementing any solutions for climate change (which most likely will be CAPEX intensive and won’t deliver any return-on-investments until something bad actually happens), always complete a cost-benefit analysis to make sure that the investment you are about to take is worthwhile.

It pays off!

Without a shadow of a doubt, climate adaptation is proven to cut costs. These may be “sleeper” investments, but if nature really starts to wreak havoc, there’s no way to describe how lucky one feels to be prepared in advance.

If you’re already struggling with climate change or fear that the threat is just around the corner, look to others and learn from them how they’ve solved problems similar to yours. Do an assessment to identify the risks and the probability of them affecting your port. Follow up with a cost-benefit analysis to see whether it’s viable for you to adapt your port. In the end, it’s your credibility with the customers, insurance companies, and employees that’s at stake. ■

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