

**The proposed adaptation pathways are framed by the
geographic, economic and social context of the island
and is a result of a consultation process
with regional stakeholders**

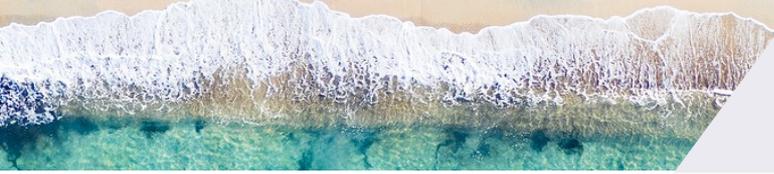
Click on the sector to see the specific recommendations 



TOURISM



**MARITIME
TRANSPORT**



APT A - Pathway Minimum Intervention low investment, low commitment to policy change This policy trajectory assumes a no-regrets strategy where the lowest cost adaptation policies are pursued to protect citizens from some climate impacts	Short-term (up to 2030)	Mid-century (up to 2050)	End-century (up to 2100)
	Public awareness programmes Drought and water conservation plans Fire management plans Post-Disaster recovery funds Monitoring, modelling and forecasting systems	Activity and product diversification Coastal protection structures Health care delivery systems Pre-disaster early recovery planning Monitoring, modelling and forecasting systems	Activity and product diversification Coastal protection structures Health care delivery systems Pre-disaster early recovery planning Adaptation of groundwater management

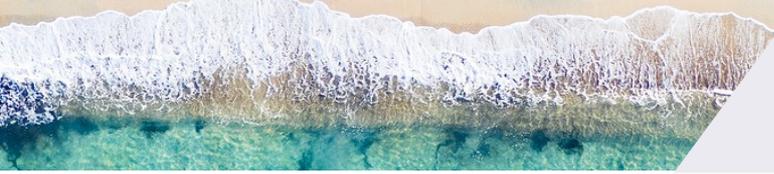
APT B - Pathway Economic Capacity Expansion high investment, low commitment to policy change This policy trajectory focuses primarily on encouraging climate-proof economic growth but does not seek to make significant changes to the current structure of the economy	Short-term (up to 2030)	Mid-century (up to 2050)	End-century (up to 2100)
	Economic Policy Instruments (EPIs) Activity and product diversification Beach nourishment Coastal protection structures Monitoring, modelling and forecasting systems Dune restoration and rehabilitation	Economic Policy Instruments (EPIs) Activity and product diversification Beach nourishment Coastal protection structures Monitoring, modelling and forecasting systems River rehabilitation and restoration	Economic Policy Instruments (EPIs) Activity and product diversification Desalination Coastal protection structures Adaptation of groundwater management River rehabilitation and restoration

APT C - Pathway Efficiency Enhancement medium investment, medium commitment to policy change This policy direction is based on an ambitious strategy that promotes adaptation consistent with the most efficient management and exploitation of the current system	Short-term (up to 2030)	Mid-century (up to 2050)	End-century (up to 2100)
	Public awareness programmes Local circular economy Water restrictions, consumption cuts and grey-water recycling Drought and water conservation plans Mainstreaming Disaster Risk Management Adaptation of groundwater management River rehabilitation and restoration Adaptive management of natural habitats	Activity and product diversification Local circular economy Water restrictions, consumption cuts and grey-water recycling Coastal protection structures Mainstreaming Disaster Risk Management Monitoring, modelling and forecasting systems Dune restoration and rehabilitation Ocean pools	Activity and product diversification Local circular economy Water restrictions, consumption cuts and grey-water recycling Coastal protection structures Mainstreaming Disaster Risk Management Monitoring, modelling and forecasting systems Dune restoration and rehabilitation Adaptive management of natural habitats

APT D - Pathway System Restructuring high investment, high commitment to policy change This policy direction embraces a pre-emptive fundamental change at every level in order to completely transform the current social-ecological and economic systems	Short-term (up to 2030)	Mid-century (up to 2050)	End-century (up to 2100)
	Financial incentives to retreat from high-risk areas Activity and product diversification Water restrictions, consumption cuts and grey-water recycling Drought and water conservation plans Post-Disaster recovery funds Monitoring, modelling and forecasting systems	Economic Policy Instruments (EPIs) Activity and product diversification Water restrictions, consumption cuts and grey-water recycling Coastal protection structures Pre-disaster early recovery planning Monitoring, modelling and forecasting systems	Economic Policy Instruments (EPIs) Activity and product diversification Water restrictions, consumption cuts and grey-water recycling Coastal protection structures Pre-disaster early recovery planning Adaptation of groundwater management

Vulnerability Reduction
 Disaster Risk Reduction
 Socio-Ecological Resilience



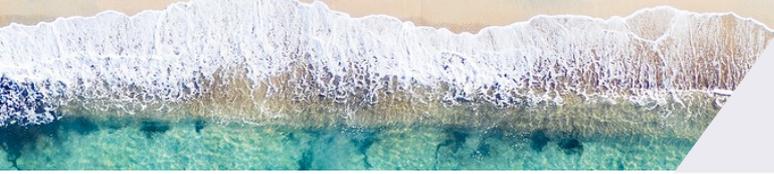


- **Public awareness programmes:** establish targeted programmes that raise awareness about climate change (specific values and protection needs) among guides, site managers and local communities.
- **Activity and product diversification:** actions to diversify the tourism activities and products and aim to reduce seasonality and overload in infrastructures and ecosystems.
- **Economic Policy Instruments (EPIs):** incentives designed and implemented with the purpose of adapting individual decisions to collectively agreed goals. Different type of instruments: pricing, environmental taxes, subsidies; trading; and voluntary agreements.
- **Beach nourishment:** artificial placement of sand to compensate for erosion. Maintaining beach width (for tourism and recreation).
- **Desalination:** removing salt from sea or brackish water to make it useable for drinking, and can contribute to adaptation in circumstances of current or future water scarcity problems.
- **Local circular economy:** economic system aimed at eliminating waste and the continual use of resources for reduced carbon emissions from materials and increased resilience to climate change.
- **Water restrictions, consumption cuts and grey-water recycling:** Restrictions of certain uses of water to allow water administration services to cope with water crises. Grey-water recycling reuse to cover water use needs that don't demand such a high-quality.
- **Financial incentives to retreat from high-risk areas:** to retreat or relocate settlements, infrastructure and productive activities from the original location due to their high exposure to floods, sea-level rise and storm surges.

- **Drought and water conservation plans:** to reduce the economic, social, and environmental consequences of drought and water scarcity, reduce the loss of water and improve efficiency in the sector.
- **Coastal protection structures:** different types of artificial structures designed to protect the coast from sea level rise or storms.
- **Fire management plans:** actions with a wide range of application such as early warning detection, escape routes and advice to citizens and tourists, mobilization and suppression of damaging fires.
- **Health care delivery systems:** pre-emptive actions and adjustments, namely reinforcing less prepared aspects of its operation and/or logistics, in order to guarantee effectiveness and efficiency.
- **Post-Disaster recovery funds:** minimize the economic and social impacts (which may include future loss of the touristic destination attractiveness) that can occur in a post-disaster context.
- **Pre-disaster early recovery planning:** the development of knowledge, good practices that aim to improve the living conditions of the affected communities, while facilitating the adjustments necessary to reduce the risk of future disasters.
- **Mainstreaming Disaster Risk Management (DRM):** plan and organize DRM along five stages including prevention, protection, preparedness, and response, recovery and review.

- **Monitoring, modelling and forecasting systems:** information system that provide timely and reliable climate information, up-to-date data on the occurrence and severity of extreme events, possible impacts and their duration.
- **Adaptation of groundwater management:** (1) conserve groundwater reservoirs, limiting water use and optimizing water reuse, and (2) restore or increase natural infiltration capacity.
- **Dune restoration and rehabilitation:** strengthening of the flood safety and sand reservoir functions of dunes. Erosion happens as a result of wind action, marine erosion, human activities and SLR.
- **River rehabilitation and restoration:** emphasise the natural functions of rivers and create vegetated buffer zones alongside watercourses. Improving micro-climatic conditions, reducing run-off and erosion, and increasing groundwater recharge.
- **Adaptive management of natural habitats:** preservation of ecosystem services which are essential for human well-being.
- **Ocean pools:** seawater pools located by the sea where waves can wash into the pool. These recreational structures are useful on SLR context, doubling as an additional protection of the coast and creating alternatives to beach leisure areas.





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	Social dialogue for training in the port sector Climate proof ports and port activities Prepare for service delays or cancellations Backup routes and infrastructures during extreme weather Marine life friendly coastal protection structures	Social dialogue for training in the port sector Climate proof ports and port activities Prepare for service delays or cancellations Backup routes and infrastructures during extreme weather Marine life friendly coastal protection structures	Awareness campaigns for behavioural change Climate proof ports and port activities Prepare for service delays or cancellations Backup routes and infrastructures during extreme weather Combined protection and wave energy infrastructures

APT B - Pathway Economic Capacity Expansion high investment, low commitment to policy change This policy trajectory focuses primarily on encouraging climate-proof economic growth but does not seek to make significant changes to the current structure of the economy	Short-term (up to 2030)	Mid-century (up to 2050)	End-century (up to 2100)
	Financial incentives to retreat from high-risk areas Social dialogue for training in the port sector Sturdiness improvement of vessels Climate proof ports and port activities Marine life friendly coastal protection structures Coastal protection structures	Financial incentives to retreat from high-risk areas Social dialogue for training in the port sector Sturdiness improvement of vessels Climate proof ports and port activities Combined protection and wave energy infrastructures Hybrid and full electric ship propulsion	Insurance mechanisms for ports Social dialogue for training in the port sector Increase operational speed and flexibility in ports Consider expansion/retreat of ports in urban planning Combined protection and wave energy infrastructures Hybrid and full electric ship propulsion

APT C - Pathway Efficiency Enhancement medium investment, medium commitment to policy change This policy direction is based on an ambitious strategy that promotes adaptation consistent with the most efficient management and exploitation of the current system	Short-term (up to 2030)	Mid-century (up to 2050)	End-century (up to 2100)
	Social dialogue for training in the port sector Climate resilient economy and jobs Refrigeration, cooling and ventilation systems Climate proof ports and port activities Reinforcement of inspection, repair and maintenance of infrastructures Marine life friendly coastal protection structures Coastal protection structures Integrate ports in urban tissue	Social dialogue for training in the port sector Diversification of trade using climate resilient commodities Refrigeration, cooling and ventilation systems Climate proof ports and port activities Early Warning Systems (EWS) and climate change monitoring Marine life friendly coastal protection structures Coastal protection structures Integrate ports in urban tissue	Awareness campaigns for behavioural change Climate resilient economy and jobs Restrict development and settlement in low-lying areas Consider expansion/retreat of ports in urban planning Early Warning Systems (EWS) and climate change monitoring Combined protection and wave energy infrastructures Hybrid and full electric ship propulsion Ocean pools

APT D - Pathway System Restructuring high investment, high commitment to policy change This policy direction embraces a pre-emptive fundamental change at every level in order to completely transform the current social-ecological and economic systems	Short-term (up to 2030)	Mid-century (up to 2050)	End-century (up to 2100)
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Vulnerability Reduction
 Disaster Risk Reduction
 Socio-Ecological Resilience





- **Social dialogue for training in the port sector:** training into social and educational issues related with the gender equality and attracting the young to the sector, while tackling climate change. Facing and how the industry is adapting to change and preparing for the future.
- **Awareness campaigns for behavioural change:** increase individuals and organisations' knowledge about climate change and the risk faced by the maritime transport sector.
- **Financial incentives to retreat from high-risk areas:** relocate settlements, infrastructure and activities from the original location due to their high exposure to flood, sea-level rise and storm surges.
- **Insurance mechanisms for ports:** risk-sharing schemes that aim to assist port operators in responding to the climate risks they are enabled to reduce. Insurance outsources the risks to a third party in exchange for a regular financial compensation.
- **Sturdiness improvement of vessels:** improve the strength of vessels to sea storms while decreasing the noise and increasing efficiency. Wave-induced loads on the ship structures are a major concern in hull design process. Ship owners should prefer designs that allow for more demanding wave regimes (for instance including the survivability to rouge waves).
- **Increase operational speed and flexibility in ports:** increase the attractiveness of ship transport in order to capture more freight and passenger movement. Faster operations also reduce the effects of heat waves on goods and people as well as decarbonise the economy.
- **Climate resilient economy and jobs:** to shift the economy and jobs towards a more climate resilient society. Perishable goods and some critical services rely heavily on the marine transport which can be affected by unpredictable extreme weather events.
- **Diversification of trade using climate resilient commodities:** to reduce dependency on trade of perishable goods and critical services, create larger stocks of goods that are climate resilient and consider whether is economically feasible, strategically justifiable and equitable.
- **Refrigeration, cooling and ventilation systems:** improve efficiency in order to reduce costs in warmer weather and maintain operations during heat waves. Ensuring the safety of passengers and workers, and manage goods that need low temperatures
- **Restrict development and settlement in low-lying areas:** assure that ports are not further developed in low-lying areas exposed to sea level rise. Planning must consider the long-term potential risks.

- **Backup routes and infrastructures during extreme weather:** create a post disaster response that ensures available alternatives when the main ports are damaged or inaccessible due to extreme weather events. It considers alternative ports and access roads.
- **Consider expansion/retreat of ports in urban planning:** to consider the expansion or reallocation of areas for future maritime transport infrastructures due to climate change risks.
- **Reinforcement of inspection, repair and maintenance of infrastructure:** adapt monitoring to a new climate context. Changes in the frequency and/or intensity of storms, SLR or temperature, for example, may have impacts in infrastructure.
- **Early Warning Systems (EWS) and climate change monitoring:** to assesses climate risks and relay that information to decision makers, companies utilities and the general public in real time. Transport operators should integrate this tool in procedures in order to protect the safety of people and goods.
- **Post-Disaster recovery funds:** the creation of recovery funds for the maritime transport sector to recover after disasters, through initiatives that get the economy up and running quickly while building-back-better. The aim is to minimize the economic and social impacts that can occur in a post-disaster context.

- **Climate proof ports and port activities:** investments that consider specific climate change projections to manage future risks in port infrastructures and improve operational safety conditions.
- **Prepare for service delays or cancellations:** promote the creation of new procedures, alternative options and channels to sell goods and transport passengers, as well as better communication to deal with delays or cancellations.

- **Marine life friendly coastal protection structures:** constructed with materials that maximize the fixation of marine organisms. Reducing climate change impacts on local ecosystems, provides water waste depuration and water quality bio-indicators inside the ports.
- **Combined protection and wave energy infrastructures:** combines sea protection structures with wave energy production. This can create economies of scale, increase coastal protection and further decrease wave propagation inside the port during normal operations.
- **Coastal protection structures:** groynes, breakwaters, artificial reefs and seawalls built in the shoreline, designed to protect the coast from sea level rise or storms, can be used to, e.g. drift and trap sediments, protect from erosion, absorb wave energy, or allow navigation.
- **Hybrid and full electric ship propulsion:** environmentally friendly for marine life, decreases carbon emissions and can increase ship manoeuvrability which is useful in small ports and under difficult weather conditions.
- **Integrate ports in urban tissue:** opening port areas to other activities, namely cultural, while gaining room in the urban landscape. This allows some port activities to be pooled from low-lying areas while leisure and cultural activities can access more waterfront space.
- **Ocean pools:** Ocean pools are situated by the sea where waves can wash into the pool. The width, length and depth of ocean pools varies and often depends on their location on the coastline. These recreational structures are a response to SLR, protect the coast and create alternatives to beach leisure areas.

