Report of the Secretary-General on oceans and the law of the sea, on the topic of "Ocean Science and the United Nations Decade of Ocean Science for Sustainable Development"
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As recognized by the General Assembly (A/RES/72/73), in its decision to proclaim the *UN Decade of Ocean Science for Sustainable Development*, starting in 2021, ocean science plays a key role for global society as a whole and generates the scientific knowledge, data and information needed for effective implementation of many of the sustainable development goals and targets that collectively make up the 2030 Sustainable Development Agenda. Relevant data and information are critically required for the purposes of monitoring progress – notably on SDG 14, which focuses on conservation and sustainable use of the oceans and their resources – and to inform risk assessment, as well as decision - and policymaking, including in response to the important challenges of increasing climate variability and change.

Thus, with respect to international maritime transport, which accounts for over 80 per cent of global merchandise trade (by volume), ocean science plays an import role in providing data and information required to ensure the safety of navigation, effectively monitor compliance with environmental regulations and respond to ship-source marine pollution incidents, among others. In addition, ocean science will be key in developing effective measures for the purposes of coastal protection and coastal zone management, as well as for climate-risk assessment, adaptation and resilience building for seaports and other coastal transport infrastructure.

Seaports - key nodes in the global network of closely interconnected supply chains - are likely to be affected directly and indirectly by climatic changes, such as rising sea levels, extreme weather events and rising temperatures, with broader implications for international trade and for the development prospects of the most vulnerable nations. Given the strategic role of seaports and of other key transport infrastructure as part of the global trading system and bearing in mind the potential for climate-related delays and disruptions across global supply-chains, enhancing the climate-resilience of key transport infrastructure is a matter of strategic economic importance and one in respect of which UNCTAD's research and technical assistance work, as well as the outcomes of a series of UNCTAD expert meetings, since 2008, have helped to raise awareness and advance the international debate (For further information, see https://unctad.org/ttl/legal).

In view of the long service life of transport infrastructure, effective adaptation requires re-thinking established approaches and practices early. Moreover, a good understanding of risks and vulnerabilities is required for the development of well-designed adaptation measures that minimize the adverse effects of climatic factors. This, however, constitutes a major challenge. The potential adverse impacts of climate variability and change may be wide-ranging, but they vary considerably by physical setting, climate forcing, as well as other factors. Thus, for instance, ports in river deltas face different challenges from open-sea ports; and extreme events and flooding may affect coastal transport infrastructure in some parts of the world, whereas melting permafrost could become a major problem in others.

For the purposes of risk-assessment and with a view to developing effective adaptation measures, generation and dissemination of more tailored data and information is important, as are targeted case studies and effective multi-disciplinary and multi-stakeholder collaboration. Guidance, best practices, checklists, methodologies and other tools in support of adaptation are urgently required, and targeted capacity building is going to be critical, especially for the most vulnerable countries. This includes SIDS,

which depend on their ports and airports for food and energy needs, external trade and – crucially – tourism, which typically accounts for a major share of GDP. In this context it is important for to explore ways to generate the necessary financial resources, especially for developing countries.

Recent UNCTAD work highlighting the importance of scientific data and evidence-based information in the context of climate change impacts and adaptation for critical coastal transport infrastructure, as well as in the context of disaster risk reduction and response includes the following:

Drawing on UNCTAD's earlier related work, in 2017, UNCTAD published the findings of a ***'Port industry survey on climate change impacts and adaptation'***, designed in collaboration with global port industry associations and other experts. The survey aimed to improve the understanding of weather and climate-related impacts on ports and to identify data availability and information needs, as well as determine current levels of resilience and preparedness among ports. Relevant information is urgently required for the purposes of risk-assessment and adaptation planning, including in particular for ports in developing regions. Results of the port industry survey provide important contextual information, particularly as the respondent port sample (collectively handling 16% of global seaborne trade) may be considered as representative. Although the majority of respondents had been impacted by weather/climate related events, including by extremes, **the study revealed important gaps in terms of relevant information available to seaports of all sizes and across regions, with implications for effective climate risk assessment and adaptation planning**.

A technical cooperation project '*Climate Change Impacts and Adaptation for Coastal Transport Infrastructure in the Caribbean*' (UNDA 1415O), implemented by UNCTAD in collaboration with a range of partners, including UNECLAC, UNDP, UNEP, the Caribbean Community Climate Change Centre, OECS Commission, as well as the ECJRC and international and regional academic experts, was completed in 2018, with high quality substantive findings and outputs, including state-of-the art flood maps, and innovative methodological approaches that have been validated by scientific peer review. The project aimed to contribute to strengthening the capacity of policy makers, transport planners and transport infrastructure managers in SIDS to (a) understand climate change impacts on coastal transport infrastructure, in particular seaports and airports, and (b) take appropriate adaptation response measures. Key project outcomes include assessment of potential vulnerabilities to climate variability and change of two Caribbean SIDS, focusing on potential operational disruptions and marine inundation risk to coastal international airports and seaports of Jamaica and Saint Lucia, under different climate scenarios; as well as a transferable methodology to assist in adaptation planning. Full documentation and information is available on the web-platform (SIDSport-ClimateAdapt.unctad.org; for an overview see also the project leaflet). Some of the main substantive findings and technical details of the methodology developed under the project were presented and discussed in a peer-reviewed scientific paper[1] and have informed the IPCC's assessment of "*Impacts of 1.5 ºC global warming on natural and human systems*", **highlighting substantial increases in risk to SIDS's critical coastal transportation infrastructure from climate changed-induced marine inundation as early as in the 2030s**, unless further climate change adaptation is undertaken. Relevant substantive findings are also reflected as part of the UN report World Economic Situation and Prospects 2019 (Ch. 2).

[1] Monioudi et. Al, *Climate change impacts on critical international transportation assets of Caribbean SIDS: The case of Jamaica and Saint Lucia*' https://rdcu.be/Q1OY, Regional Environmental Change (2018).

The important trade related implications of weather and climate-related extreme events were also highlighted by UNCTAD at the COP 24 in Katowice, as well as in an online article and as part of an interactive discussion, focusing on the need to reduce economic losses from disasters and co-organized with UNISDR and ITC) on the occasion of the International Day for Disaster Reduction 2018.

Ocean science has an important role to play in the context of adapting critical transport infrastructure and services to the impacts of climate variability and change and of enhancing their overall climate and disaster-risk resilience. Relevant scientific data is required, in particular, for monitoring and early warning systems for effective disaster risk reduction and management and effective emergency response; as well as forecasting and effective risk-assessment to improve levels of preparedness and help take appropriate adaptation response measures.