Ad Hoc Expert Meeting on

Addressing the Transport and Trade Logistics Challenges of the Small Island Developing States (SIDS): Samoa Conference and Beyond

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Climate change impacts and adaptation for transport infrastructure in SIDS – the case for action

Presentation by

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Climate change impacts and adaptation for transport infrastructure in SIDS - the case for action

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unctad.org/ttl/legal

Synopsis

- Climate change implications for transport
- Relevant work by the UNCTAD Secretariat and follow-up
- The special case of the SIDS
- UNDA Project 2014-2017: Climate change impacts on coastal transport infrastructure in the Caribbean: Enhancing the adaptive capacity of Small Island Developing States
Climate change implications for transport [1]

Climate change

- A global challenge and “a defining issue of our era” (UN SG)
- Increasingly compelling scientific evidence (IPCC AR5, 2013)
- Huge potential costs associated with inaction (5-20 % of the Global GDP, annually (STERN Review 2006))
- A serious development threat particularly for the Least Developed Countries (LDCs) and the Small Island Developing States (SIDS)
  - Since 2008, integration of climate change considerations into UNCTAD’s work on transportation

Climate change implications for transport [2]

Maritime transport

- The facilitator of global trade, carrying over 80% of the volume (70% of value) of world merchandise trade – port to port
- Provides access to global markets: crucial for all countries - developed and developing - including the landlocked (and sea-locked)
- Derived demand – reflecting developments in global economy and merchandise trade
- Globalization: strong interconnectedness / interdependence of shipping/ports
- Shipping and ports are key-nodes in global supply-chains
Climate change implications for transport [3]

The climate change debate: two sides of the “coin”: causes - effects

- **Mitigation**: action directed at addressing CC causes (long-term)

- **Adaptation**: action directed at coping with CC impacts (short-long term);
  - requires understanding of impacts, which vary considerably by type of forcing, region, sector etc.

**In Transport:**
- much of international debate/policy action focuses on CC mitigation (i.e. reduction / control of GHG emissions)
- Comparatively little focus on study of impacts and development of adaptation policies/actions
Climate change implications for transport [4]

Climate change/extreme events likely to have direct and indirect impacts on maritime transport infrastructure and services

Sea-level rise, temperature and precipitation changes, extreme storms and floods and other factors are likely to
- affect ports and coastal transport infrastructure, hinterland transport and the broader supply-chain
- affect demand for shipping/transport costs/global production locations
- open new arctic sea-lanes due to polar ice melting

Major climate change impacts on coastal transport infrastructure

<table>
<thead>
<tr>
<th>Factor</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea level (mean and extreme)</td>
<td>Coastal transport infrastructure</td>
</tr>
<tr>
<td>• Mean sea level changes</td>
<td>Damages in port infrastructure/cargo from incremental and/or catastrophic inundation and wave regime changes; higher seaport construction/maintenance costs; sedimentation/dredging issues in port/navigation channels; effects on key transit points; increased risks for coastal road links; relocation of people/businesses; insurance issues</td>
</tr>
<tr>
<td>• Increased destructiveness of storms/storm surges</td>
<td></td>
</tr>
<tr>
<td>• Changes in the wave energy and direction</td>
<td></td>
</tr>
<tr>
<td>Precipitation</td>
<td>Seaport, airport and road infrastructure inundation; damage to cargo/equipment; and vital node damage (e.g. bridges)</td>
</tr>
<tr>
<td>Temperature</td>
<td>Damage to infrastructure/equipment/cargo and asset lifetime reduction; higher energy consumption for cooling cargo; changes in transport demand; lower aircraft loads allowed-need for runway extension</td>
</tr>
<tr>
<td>• Higher mean temperatures,</td>
<td></td>
</tr>
<tr>
<td>• Heat waves and droughts</td>
<td></td>
</tr>
<tr>
<td>• Increased variability in temperature extremes</td>
<td></td>
</tr>
</tbody>
</table>
Flood risk at US Gulf coast under sea level rise 0-6-1.2 m. Relative sea level rise of about 1.2 m (4 feet) could permanently inundate more than 2400 miles of roads, over 70% of the existing port facilities, 9% of the railway lines and 3 airports.

Relevant work by the UNCTAD Secretariat and follow-up

<table>
<thead>
<tr>
<th>Year</th>
<th>Follow-up</th>
</tr>
</thead>
</table>
| 2009 | UNCTAD Multiyear Expert Meeting: “Maritime Transport and the climate change challenge”
UTCAD (ed.) Maritime Transport and the Climate Change Challenge
Earthscan (Routledge/Taylor&Francis) (2012) 327 pp |
| 2010 | Joint UNECE-UNCTAD Workshop:
“Climate change impacts on international transport networks”
UNECE Group of Experts on Climate Change Impacts and Adaptation for International Transport Networks (2011-2014)
2012 International Conference - including session on SIDS
2014 Final Report - Climate Change Impacts and Adaptation for International Transport Networks |
| 2011 | UNCTAD Ad Hoc Expert Meeting:
“Climate change impacts and adaptation: a challenge for global ports”
Academic paper co-published by Experts (2013)
Becker et. al, A note on climate change adaptation for seaports, Climatic Change, 2013 |
| 2013-2014 | UNCTAD Port-Industry Survey on Climate Variability and Change |
The special case of the SIDS

Large dependency on imports (i.e. international transport)

High Transport costs (e.g. transport costs of Caribbean trade at least 30% higher than the world average, see Pinnock and Ajagunna, 2012)

Coastal transport infrastructure (seaports and airports): critical lifelines for external trade, food, energy, tourism (cruise-ships and air transport)

These assets are threatened by sea level rise and extreme events (storms)

Strong nexus between transport and tourism: “Sun-and-sand-tourism”, often a very significant SIDS industry, is threatened by climate-driven coastal and beach erosion, together with its facilitating infrastructure (i.e. seaports, airports, coastal access roads)

Caribbean SIDS: The most air-transported tourist dependent region

<table>
<thead>
<tr>
<th>Country</th>
<th>Travel &amp; tourism</th>
<th>% of GDP (World Ranking, 2010)</th>
<th>% visitors arriving by air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anguilla</td>
<td>61.0 (5)</td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>Antigua &amp; Barbuda</td>
<td>78.5 (1)</td>
<td></td>
<td>95</td>
</tr>
<tr>
<td>Bahamas (the)</td>
<td>46.5 (8)</td>
<td></td>
<td>88</td>
</tr>
<tr>
<td>Barbados</td>
<td>48.1 (6)</td>
<td></td>
<td>92</td>
</tr>
<tr>
<td>Belize</td>
<td>28.2 (17)</td>
<td></td>
<td>85</td>
</tr>
<tr>
<td>Bermuda</td>
<td>11.2 (65)</td>
<td></td>
<td>86</td>
</tr>
<tr>
<td>British Virgin Islands</td>
<td>43.7 (10)</td>
<td></td>
<td>94</td>
</tr>
<tr>
<td>Cayman Islands</td>
<td>23.3 (24)</td>
<td></td>
<td>67</td>
</tr>
<tr>
<td>Dominica</td>
<td>23.3 (23)</td>
<td></td>
<td>88</td>
</tr>
<tr>
<td>Grenada</td>
<td>24.4 (22)</td>
<td></td>
<td>96</td>
</tr>
<tr>
<td>Guyana</td>
<td>11.5 (63)</td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>Haiti</td>
<td>7.0 (125)</td>
<td></td>
<td>n.a.</td>
</tr>
<tr>
<td>Jamaica</td>
<td>25.4 (20)</td>
<td></td>
<td>92</td>
</tr>
<tr>
<td>Montserrat</td>
<td>n.a.</td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>St. Kitts &amp; Nevis</td>
<td>30.5 (16)</td>
<td></td>
<td>91</td>
</tr>
<tr>
<td>St. Lucia</td>
<td>35.1 (13)</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>St. Vincent &amp; the Grenadines</td>
<td>23.6 (23)</td>
<td></td>
<td>98</td>
</tr>
<tr>
<td>Suriname</td>
<td>4.6 (164)</td>
<td></td>
<td>93</td>
</tr>
<tr>
<td>Trinidad &amp; Tobago</td>
<td>10.9 (66)</td>
<td></td>
<td>95</td>
</tr>
</tbody>
</table>

Tourism: 12% of GDP
In some Caribbean SIDS more than 50% of GDP (ECLAC, 2011)
Recent mean sea level rise projections for 2100

Key: 1, IPCC (2007), 0.18-0.59 m; 2, Rahmstorf et al. (2007); 3, Horton et al. (2008); 4, Rohling et al. (2008); 5, Vellinga et al. (2008); 6, Pfeffer et al. (2008); 7, Kopp et al. (2009); 8, Vermeer and Rahmstorf (2009); 9, Grinsted et al. (2010); 10, Jevrejeva et al. (2010); 11, Jevrejeva et al. (2012); 12, Mori et al. (2013); and 13, IPCC (2013). Projection variability reflects differences in approaches (UNECE, 2013).

Shipping and seaports are vulnerable to storms

Seaports within 50 km of tropical sea storm tracks (1960–2010). Port and storm data from National Geospatial-Intelligence Agency (2011) and Knapp et al. (2010). (Becker et al., 2013)
Touristic beach erosion

Many SIDS beaches are under severe threat of CC-driven erosion. For example, for many Caribbean islands, average beach retreat/erosion is 0.5-1.0 m/yr (Cambers, 2009; Peduzzi et al. 2013).

UNCTAD UN Development Account Project 2014-2017

Technical assistance project to build the adaptive capacity of SIDS, taking into account regional specificities

"Climate change impacts on coastal transport infrastructure in the Caribbean: Enhancing the adaptive capacity of Small Island Developing States (SIDS)"

- Focus on key coastal infrastructure for transport (i.e. ports and as appropriate airports)
- Case-study approach involving 2 vulnerable Caribbean SIDS (Jamaica and St Lucia)
- Objective:
  - enhance the adaptive capacity at the national level (case-study countries)
  - develop a transferable methodology for assessing climate-related impacts and adaptation options in SIDS
- Guidance material, national and regional training workshops, and web platform
Thank you!

See unctad.org/ttl/legal for further information/documentation/presentations

UNCTAD Expert Meeting 2009
Summary of the proceedings (UNCTAD/DTL/TLB/2009/1)

UNECE-UNCTAD Workshop 2010
Background note by UNECE and UNCTAD secretariats ECE/TRANS/WP.5/2010/3

UNCTAD Ad Hoc Expert Meeting 2011
Information Note (UNCTAD/DTL/TLB/2011/1)
Main outcomes and Summary of Discussions (UNCTAD/DTL/TLB/2011/3)


On UNECE Expert Group on CC Impacts and Adaptation for International Transport Networks, see http://www.unece.org/trans/main/wp5/wp5_ge3_02.html