Fourteenth meeting of the Technology Executive Committee

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Background note

Recommendations for entry points for collaboration with the Executive Committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts

A report by the TEC taskforce on emerging and cross-cutting issues

I.   Background

1.   In October 2015, the Chair and Vice-Chair of the TEC for 2015 received a letter from the Co-Chairs of the Executive Committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts (WIM ExCom). The letter informed them on the outcome of the discussion on the workplan of the WIM ExCom at its first meeting in September 2015. It also invited the TEC to consider making efforts to reduce and avert losses and damages among particularly vulnerable developing countries, vulnerable populations and the ecosystems that they depend on, as the TEC undertakes its work, and to share the outcomes with the WIM ExCom.

2.   At TEC 12 (April 2016), in response to the letter from the WIM ExCom, the TEC agreed to engage with the WIM ExCom to exchange views and explore areas of common interest relevant to the work of both bodies, with the aims to: (a) enhance understanding of technologies that reduce or avert loss and damage and adaptation technologies that could be relevant to loss and damage, particularly in vulnerable developing countries; and (b) identify a specific intervention related to technology that the TEC can contribute relevant to work on loss and damage, as reflected in its rolling workplan for 2016-2018. The TEC also agreed to assign its task force on emerging and cross-cutting issues to deal with these matters and requested the Chair and Vice-Chair of the TEC to lead the initial engagement with the WIM ExCom on behalf of the TEC.

3.   At TEC 13 (September 2016), the TEC agreed on the importance of further engagement with the WIM ExCom to enhance understanding of technologies that reduce or avert loss and damage, and requested its task force on emerging and cross-cutting issues[1] to undertake further work on this matter by:

(a)   Identifying TEC outputs that may be relevant to this collaboration;

(b)   Examining further the information provided by the WIM ExCom and any relevant information resulting from Marrakesh outcomes related to loss and damage;

(c)   Preparing recommendation for entry points for collaboration with the WIM ExCom, for TEC consideration at TEC 14.

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[1] In implementing its task, the taskforce on emerging and cross-cutting issues has engaged non-Party stakeholders by including a representative of each of the constituencies, namely business and industry non-governmental organizations (BINGO), environmental non-governmental organizations (ENGO), and research and independent non-governmental organizations (RINGO).

II.   Objectives of the note

4.   The objectives of this note is to provide recommendations for entry points for collaboration with the WIM Excom, consisting of: (a) an analysis on common areas of interests of both bodies; and (b) possible means of collaboration in these areas.

III.   Possible action by the Technology Executive Committee

5.   The TEC will be invited to consider the recommendations, and provide guidance on further work on this matter.

IV.   Scope and approach

6.   As the basis for considering the recommendations for the entry points, the taskforce considered it important to first review the work of the TEC that may be relevant to the issue of loss and damage. To complement this, the TEC also looked at the work of CTCN as the implementation arm of the Technology Mechanism and identified areas which may be relevant, particularly around capacity-building activities.

7.   In considering what kind of technological areas that could be relevant to the issue of loss and damage, the taskforce firstly reviewed the latest developments of the five-year rolling workplan of the WIM ExCom. At COP22, the COP approved the indicative framework for the five-year rolling workplan of the WIM ExCom[2], which contained the indicative strategic workstreams (see Annex). The following elements contained in the indicative strategic workstreams were identified as the areas where the TEC may find relevant to contribute their views:

(a)   Slow onset events;

(b)   Emergency preparedness including early warning systems;

(c)   Measures to enhance recovery and rehabilitation and build back/forward better.

8.   Secondly, the taskforce identified (technological) sectors[3] relevant to the three areas identified above (hereinafter reffered to as the three Loss and Damage areas) and then reviewed the work/output of the TEC and capacity-building activities of the CTCN in these sectors.

9.   Based on the review of work/output of the TEC and the CTCN, common areas of interests of both bodies and possible means of collaboration were identified.

V.   TEC outputs/work that may be relevant for potential collaboration with the WIM ExCom

A.   Slow onset events

10.   The Cancun Adaptation Framework (1/CP.16)[4] stated that slow onset events cover these elements: sea level rise; increasing temperatures; ocean acidification; glacial retreat and related impacts; salinization; land and forest degradation; loss of biodiversity; and desertification. Sectors that may be relevant to the scope of slow onset events mentioned above are:

(a)   Agriculture and forestry;

(b)   Coastal zones;

(c)   Infrastructure and urban planning;

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[2] The indicative framework is contained in the report of the WIM ExCom for COP22 (FCCC/SB/2016/3).

[3] Unless reference materials have used their own classification, the classification of sectors in this note is based on the classification the CTCN uses for sectors on adaptation on the website, namely agriculture and forestry, coastal zones, early warning and environmental assessment, human health, infrastructure and urban planning, marine and fisheries, and water.

[4] FCCC/CP/2010/Add.1.

(d)   Marine and fisheries;

(e)   Water.

11.   Using this context, the taskforce reviewed the TEC work/outputs which could be relevant to the topic of slow onset events in accordance with the elements of slow onset events and the relevant sectors specified above. These include the work of the TEC on two thematic areas: technology needs assessments (TNA) and technologies for adaptation.

Technology Needs Assessments

12.   According to the third synthesis report on TNA [5], the most commonly prioritized sectors for adaptation in Parties' TNA reports were agriculture (84 percent of the Parties) and water resources (77 percent). Within the agriculture sector, the majority of the technologies prioritized were related to crop management. Biotechnologies, including technologies related to crop improvement, new varieties and drought-resistant, salient-tolerant and short-maturing varieties, were the most prioritized technologies.

13.   Within the water sector, parties prioritized technologies relating to rain water harvesting and water catchments. It may be noted that 93 percent of the total number of water technologies prioritized can be categorized as supply-side measures, with the remaining 7 percent relating to demand-side measures.

14.   Further, 32 percent of Parties included their technology needs for infrastructure and settlements (including coastal zones) in their TNA reports as third prioritized sector. Within this sector, most of the prioritized technologies were related to coastal protection, including both hard and soft measures. The most often prioritized technology was wetland restoration, with other prioritized technologies including seawalls, community-based early warning systems for natural disaster prevention, and beach reclamation.

Technologies for adaptation

Discussion in the workshop on technologies for adaptation (March 2014)

15.   The TEC held the workshop on technologies for adaptation in March 2014[6], in conjunction with TEC 8 and with the support of the Adaptation Committee. At the workshop, the following information relevant to slow onset events was shared:

(a)   *"Background Paper on Technologies for Adaptation"*[7]: Overview and synthesis on experiences and lessons learned from success and failures in the three sectors: agriculture (e.g. seasonal forecasts and insurance, water-saving irrigation, and diversification and resilient crop varieties); water (e.g. boreholes and tube wells, and desalination); and infrastructure and settlements including coastal zones (e.g. wetland restoration, seawalls, and storm surge barriers)

(b)   *"Adaptation to climate change in the cold tropics: challenges from the Andes"*: The experiences and challenges in addressing land degradation in the Andes

(c)   *"Development and transfer of water technologies for agriculture in Africa"*: Good practice for the distribution of pressure irrigation pumps in Africa

TEC Brief #4 (agriculture sector) and #5 (water sector)

16.   Other work that maybe relevant as they touched upon a number of issues related to slow onset events are the TEC briefs on technologies for adaptation. The TEC published two TEC Briefs[8] in November 2014 which focused on technologies for adaptation in the agriculture and water sectors. TEC Brief #4 addressed the application of adaptation technologies in agriculture sector, e.g. seasonal forecasts, water-saving irrigation, and resilient crop varieties. TEC Brief #5 addressed the application of adaptation technologies in the context of water scarcity, e.g. boreholes and tube wells, rainwater harvesting and desalination.

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[5] FCCC/SBSTA/2013/INF.7.

[6] <http://unfccc.int/ttclear/events/2014_event1>.

[7] <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/events_workshops_adaptationtechs/e7be62ce709c401a82424d8ada44362b/89c4a1f821144621a09dcdd3654ecfa6.pdf.>

[8] <http://unfccc.int/ttclear/tec/documents.html.>

B. Emergency preparedness including early warning systems

17.   The following sections suggests TEC work/outputs which could be relevant to the topic of emergency preparedness including early warning systems.

Technology needs assessments

18.   According to the third synthesis report on TNA, 10 percent of Parties included their technology needs for climate observation and early warning systems in their TNA reports as fourth prioritized sector.

Technologies for adaptation

Discussion in the workshop on technologies for adaptation (March 2014)

19.   At the workshop, the following information relevant to this topic was shared:

(a)   *"Background Paper on Technologies for Adaptation"*: Information on some experiences and lessons learned about community-based early warning systems

(b)   *"The Power of Information and Communication Technology for Adaptation"*: How information and communication technology can contribute to adaptation, including disaster prevention

C. Measures to enhance recovery and rehabilitation and build back/forward better

20.   In the light of climate change, recovery and rehabilitation would be needed when communities and/or infrastructures had been severely damaged by extreme events such as flood or typhoon, or also when ecosystems or natural resources had been degraded due to the impact of climate change. In this context, sectors that may be relevant to this topic are:

(a)   Agriculture and forestry;

(b)   Coastal zones;

(c)   Infrastructure and urban planning;

(d)   Marine and fisheries;

(e)   Water.

Technology needs assessments

21.   According to the third synthesis report on TNA, most of the prioritized technologies within infrastructure and settlements (including coastal zones) sector were related to coastal protection, including both hard and soft measures, and the most often prioritized technology was wetland restoration, which may have relevance with "recovery and rehabilitation".

Technologies for adaptation

22.   Among the above sectors, agriculture and water sectors have been taken up in the TEC work on technologies for adaptation, as stated in the section A above. However, the TEC has not done any work that touches upon "recovery and rehabilitation" so far.

23.   As can be seen from the review above, there are many works of the TEC that appear to be relevant to the issues considered under loss and damage from technological perspectives. The work on synthesis of TNAs provided a good picture of where countries prioritise their technological needs. In some of the themes, the TEC has undertaken deeper analysis focusing on the technological aspects and lessons learnt from the successful implementation of such technologies, for example the TEC Brief on technologies for adaptation in agriculture and water sectors. In other sectors, such as coastal zones, infrastructure and early warning systems, the TEC has not done so much work in relation to the themes.

VI. Information on CTCN capacity-building activities

24.   The CTCN, as the implementation arm of the Technology Mechanism, has provided various types of supports for developing countries in enhancing their climate technology efforts, including capacity-building activities. The following sections provide information on CTCN capacity-building activities which may have

relevance to loss and damage issues, by focusing on the three Loss and Damage areas and relevant sectors identified in section V.

A. Webinars

25.   CTCN webinars are a part of capacity-building activities of the CTCN. The webinars provide interactive presentation on technology topics, highlighting technology opportunities and barriers, and offering concrete examples of successful policies and tools that can be replicated in other regions. Webinars are free to the public, conducted by experts from around the world and organized by Climate Technology Centre Consortium and Network member.

26.   As of 23 February 2017, 74 webinars have been recorded on the CTCN website [9]. Table 1 below shows the number of the recorded webinars which may have relevance with the three Loss and Damage areas, and examples of the titles of them, for each relevant sector.

Table 1. The recorded webinars which may have relevance with L&D issues

Sectors	Number of webinars	Examples of the titles of webinars
Water	13	• *Green infrastructure for development and climate resilience* • *Use of satellite data for drought and flood management* • *Introduction on technologies for adaptation to climate change in the water sector*
Coastal zones	1	• *Coastal management technologies for climate change adaptation*
Agriculture and forestry, Early Warning and Environmental Assessment, Infrastructure and Urban planning	1	• *Risk mapping for climate change adaptation – using open GIS data and tools in order to build resilience*

B. Technical assistance

27.   The CTCN provides technical assistance through the following types of assistance: technology identification and prioritization; research and development of climate technologies; feasibility of climate technology options; law, policy and regulatory reform recommendations; finance facilitation and market creation; training, awareness raising and sharing experience. According to the CTCN website[10], more than 16 percent of the requests were classified as training, awareness raising and sharing experience. Futher, even if requests were classified as other types of assistance, capacity-building elements were embedded in many cases.

28.   As of 23 February 2017, 170 of technical assistance requests from developing countries had been submitted to the CTCN and 101 of them are published as active technical assistances on the CTCN website[11]. Table 2 below shows the number of the published requests which may have relevance with the three Loss and Damage areas, and examples of the titles of them, for each relevant sectors. The cases which obviously did not seem to have relevance to the three Loss and Damage areas were omitted (e.g. "Financing strategy for light rail transit" as the infrastructure and urban planning).

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[9] <https://www.ctc-n.org/news-multimedia/recorded-webinars>.
[10] <https://www.ctc-n.org/technical-assistance/request-visualizations>.
[11] <https://www.ctc-n.org/technical-assistance/data>.

Table 2. The published technical assistance requests which may have relevance with L&D issues

Sectors	Number of requests	Examples of the titles of requests
Agriculture and forestry	9	• *Technology development for climate resilience and efficient use of resources in the agricultural sector in Thailand* • *Capacity-building in ecosystem-based methods and green infrastructure for sustainable agriculture intensification and disaster risk management*
Early warning and environmental assessment	5	• *Preparing an integrated flood management plan for Dungsumchu Basin in Samdrupjongkhar* • *Strengthening Bangkok's early warning system to respond to climate induced flooding*
Coastal zones	5	• *Technology for monitoring & assessment of climate change impact on geomorphology in the coastal areas of Bangladesh* • *Development of technology tools for the assessment of impacts, vulnerability and adaptation to climate change in the coastal zones of Uruguay*
Water	4	• *Climate resilient decision making methods for Lake Victoria* • *Identification and prioritization of technologies to address water scarcity and climate change impacts in Namibia*
Infrastructure and urban planning	1	• *Hydrodynamic modelling for flood reduction and climate resilient infrastructure development pathways in Jakarta*
Marine and fisheries	1	• *Technical assistance and capacity-building for the development of a climate change strategy for the sector of fisheries and aquaculture*

29.   As can be seen from the review above, the CTCN has undertaken several capacity-building activities and provided technical assistances to countries on issues considered under loss and damage, based on country's specific requests.

VII.   Recommendations

30.   Having reviewed the work of both TEC and CTCN, the taskforce would propose recommendations for collaboration with the WIM ExCom in two aspects:

     (a)   Common areas of interests of both bodies;

     (b)   Possible means of collaboration.

A.   Common areas of interests of both bodies

31.   Table 3 below presents a matrix of the sectors/technological areas of work of the TEC (and the Technology Mecahnism) against the three Loss and Damage areas identified from the indicative framework for the five-year rolling workplan of the WIM Excom.

32.   According to the third synthesis report on TNA, as stated in section V, the most commonly prioritized sectors for adaptation in Parties' TNA reports were agriculture and water resources, followed by infrastructure and settlements including coastal zones and climate observation and early warning systems. Within the sector of infrastructure and settlements including coastal zones, most of the prioritized technologies were related to coastal protection, including both hard and soft measures. Further, the information on the CTCN technical assistance requests shows that the most frequent sector for which developing countries requested assistances was agriculture and forestry, followed by early warning and environmental assessment, coastal zones, and water (see table 2).

Table 3. Matrix of common areas of interests based on the work of the TEC and the WIM ExCom

Loss & Damage areas Technological Sectors	Slow onset events	Emergency preparedness including early warning systems	Measures to enhance recovery and rehabilitation and build back/forward better
Agriculture and forestry	X		X
Coastal zones	X		X
Early warning and environmental assessment		X	
Infrastructure and urban planning	X		X
Marine and fisheries	X		X
Water	X		X

33.   Consequently the following sectors could be regarded as the sectors with higher interest from developing countries:

(a)   Agriculture and forestry;

(b)   Water;

(c)   Coastal zones;

(d)   Early warning and environmental assessment.

34.   Among these sectors, the TEC has addressed agriculture and water sectors as part of the work on technologies for adaptation, including publishing the TEC Briefs. Also it may be noted that the CTCN has provided many webinars on water sector compared with other sectors (see table 1). On the contrary, there has been little work by the TEC relevant to **coastal zones** and **early warning and environmental assessment** so far. The TEC may be able to further fulfil its role by addressing these new areas.

35.   Therefore, it is recommended that these two sectors could be the common areas of interests of both bodies. Further analysis also shows that technologies for coastal zones could contain some technological elements for early warning and environmental assessment, as described in TNAs and TEC work in adaptation technologies. The proposed focus is highlighted below:

Technologies for coastal zones, including:

(a)   **Coastal protection (hard measures)**, for example sea walls, storm surge barriers, beach reclamation, flood gates, tidal barriers;

(b)   **Conservation and restoration of coastal zones (soft measures)**, for example conservation/restration of wetland, mangrove or dune;

(c)   **Early warning systems for coastal zones**, for example community-based early warning systems;

(d)   **Tools for risk management in coastal zones**, for example monitoring and evaluation of coastal land loss, modelling for impact assessment, integrated management of coastal zones.

36.   In this context, the taskforce wish to emphasize that the precautionary principles should be the guiding principles in considering and formulating action and technological intervention. Application of the precautionary principles could mean identifying potential risks and their management in order to reduce or avert risks that would cause loss and damage. For example, efforts to conserve existing wetland in advance could make the extent of wetland restoration (i.e. the need of recovery and rehabilitation) less extensive. Such proactive approaches could include measures to address the impacts or risks in the short, medium and long terms, as appropriate, some of which may be relavant to slow onset events or emerging preparedness.

B.   Possible means of collaboration

37.   In addition to technological areas that represent a common interest and guiding principles for formulating technology interevention, the taskforce also identified possible means of collaboration with the WIM ExCom. These include:

(a)   **Development of a joint policy brief**, for example on the area of technologies for coastal zones as explained in the section A above;

(b)   **Possible participation in relevant meetings of the bodies** (e.g. expert meetings, thematic dialogues), bearing in mind the cost implications of such participation;

(c)   **Exchange of inputs and advice between the two bodies to enhance the work of the bodies**. One example is to continue the dialogue with regard to how enhanced measures of preparedness and resilience building could help reduce and avert loss and damage.

Annex

Indicative framework for the five-year rolling workplan of the Executive Committee of the Warsaw International Mechanism

1.   The Executive Committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts presents the following framework, including table 2, as the basis for its five-year rolling workplan. The workplan will be undertaken in the context of the Paris Agreement, decisions 1/CP.16, 3/CP.18, 2/CP.19, 2/CP.20, 1/CP. 21 and 2/CP.21 and future relevant decisions and will implement the following three functions of the Warsaw International Mechanism:

(a)   Enhancing knowledge and understanding of comprehensive risk management approaches to address loss and damage associated with the adverse effects of climate change, including slow onset impacts;

(b)   Strengthening dialogue, coordination, coherence and synergies among relevant stakeholders;

(c)   Enhancing action and support, including finance, technology and capacity-building, to address loss and damage associated with the adverse effects of climate change.

2.   The workplan will also take into account, in a cross-cutting manner:

(a)   Actions to complement, draw upon the work of and involve other bodies under and outside the Convention;

(b)   Particularly vulnerable developing countries, segments of the population that are already vulnerable owing to geography, socioeconomic status, livelihood, gender, age, indigenous or minority status or disability, and the ecosystems that they depend on;

(c)   The role of sustainable development, including policy and regulatory enabling environments;

(d)   Events that may involve irreversible and permanent loss and damage.

Table 2
Indicative strategic workstreams of the five-year rolling workplan of the Executive Committee of the Warsaw International Mechanism

(a)   Slow onset events;
(b)   Non-economic losses;
(c)   Comprehensive risk management approaches (including assessment, reduction, transfer, retention), to address and build long term resilience of countries, vulnerable populations and communities to loss and damage, including in relation to extreme and slow onset events, inter alia, through: • Emergency preparedness, including early warning systems; • Measures to enhance recovery and rehabilitation and build back/forward better; • Social protection instruments including social safety nets; and • Transformational approaches.
(d)   Migration, displacement and human mobility, including the task force on displacement;[a]
(e)   *Placeholder for finance-related topics;*
(f)   *Placeholders for additional results from the initial two-year workplan;*
(g)   *Placeholder for emerging needs.*

[a] Task force as referred to in decision 1/CP.21, paragraph 49.