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**REVIEW OF PROGRAMME PLANNING AND IMPLEMENTATION**

(Item 5(e) of the provisional agenda)

**Desertification and Land Degradation**

*Note by the Secretariat*

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## I. BACKGROUND

1. Desertification and land degradation (DLD) are a significant challenge for sustainable development affecting soil, air and water quality, threatening forest and woodlands, pasture and rangelands as well as irrigated and rain-fed croplands. In recognition of the serious threat and impact of DLD on the economy, human wellbeing and the environment, NEASPEC member States have developed various policies and programmes to combat DLD, and established partnerships to take joint actions in affected countries and areas.<sup>1</sup>

2. To respond to the multifaceted challenges, NEASPEC facilitated capacity-building and knowledge-sharing of member States during 2011-2013, and subsequently launched the North-East Asia Multi-Stakeholder Plan on Combating DLD (NEAMSP) at the SOM-20 in 2016 as a platform for information exchange and sharing of expertise; creating linkages among governments, civil society organizations, and research institutions to forge public-private partnerships; supporting the regional ecological restoration and sustainable utilization of resources; and contributing to efforts to achieve the land degradation neutrality (LDN) targets in North-East Asia.

3. This was followed by the establishment of the Northeast Asia Network for Desertification, Land Degradation and Drought (DLDD-NEAN) by forestry agencies of China, Mongolia and the Republic of Korea in 2012, which was also joined by the Russian Federation in 2020. Having reviewed the operationalization of DLDD-NEAN and the potential overlap of programme activities with NEASPEC, member States had considered re-orienting the NEASPEC work since the SOM-22 in 2018 and decided to focus on developing an integrated approach to the interlinked issues of DLD. As reflected in the NEASPEC Strategic Plan 2021-2025, member States agreed to conduct a stock-taking study on the interlinkage of climate change mitigation and DLD, develop a subregional approach and organize activities on nature-based solutions for addressing climate change and DLD, and hold stakeholder dialogues on the interlinkages and nature-based solutions.

4. To review the current scientific assessment of the interlinkage, particularly, greenhouse gas emissions from the land sector, the Secretariat conducted a stock-taking study on the interlinkage of DLD and climate change in 2021 (see Annex I). Recommending subregional approaches, the study

- (a) examined the existing scientific assessments on carbon emissions from land-use change and management in North-East Asia (NEA);

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<sup>1</sup> Global Land Outlook Northeast Asia Thematic Report, 1 August 2019, UNCCD, <https://knowledge.unccd.int/publication/northeast-asia>

- (b) reviewed main assessment results based on different methodologies, such as Bookkeeping/accounting models (FAOSTAT), Dynamic global vegetation models (DGVMs), Remote Sensing data related to land use change, Country Reporting of GHG Inventories (NGHGs), Land-use change transitions, definitions and assumptions, Integrated assessment models (IAMs), and Earth System Model (ESM); and
- (c) identified gaps in the assessments, policy implications for mitigating carbon emissions and areas for collaborative work within the scientific community and between countries.

5. In parallel, the Secretariat worked together with the ESCAP ICT and Disaster Risk Reduction Division (IDD) to understand the impacts of climate change on desertification, land degradation and drought (DLDD) in North-East Asia. Based on the most recent Intergovernmental Panel on Climate Change (IPCC) climate projections under two different scenarios namely SSP2-RCP4.5 (intermediate emission) and SSP5-RCP8.5 (high emission), the report assessed desertification, land degradation and drought risks, and studied their potential socio-economic impacts in North-East Asia (see Annex II).

## **II. KEY FINDINGS OF STOCK-TAKING STUDY ON THE INTERLINKAGE OF DLD AND CLIMATE CHANGE**

6. Annually about 12 million hectares of land are degraded worldwide mainly through deforestation and conversion to agricultural land. According to the IPCC, Land Use, Land Use Change and Forestry (LULUCF) along with agriculture emitted about 13% of global carbon emissions during 2007-2016. With high level of emissions (2.6 GtCO<sub>2</sub> in 2018) coupled with rapid economic development, land in North-East Asia is rapidly degrading. Dominance of arid/semi-arid grasslands in NEA region further increases the vulnerability of land to degradation.

7. Noting the data discrepancies across data sources and methods, i.e., National Greenhouse Gas Inventory (NGHGI) reports, scientific publications, and World Resources Institute Climate Analysis Indicators Tool (WRI-CAIT) database, the study noted the trend of carbon emissions from land use and management in NEA steadily decreased from LULUCF up to 2016 and then remained steady around until 2018. LULUCF sector is a large emitter of carbon in Mongolia and the Democratic People's Republic of Korea with an average annual emission of 3.13 and 3.3 MtC, respectively. The study also noted that cropland, wetland and settlements are large emitters of carbon in the NEA subregion, while forest land and grassland serve as significant carbon pools in the Russian Federation, China and Japan.

### *Forest emissions*

8. In China, the review of scientific assessments indicated that China's emissions from land use continued to increase from 1990 to 2016 while forest emissions decreased over the year. This decrease in emissions is reflected in the carbon pool in forest lands from -434 TgC (from 1989-1993) to -37510 TgC (from 2011-2015). Japan's forest land has offset all the emissions from other LULUCF sub-categories making it a net carbon sink sector since 1990 due to large-scale plantation carried out during the 1960s. However, Japan's NGHGI reports a decreasing trend in net removals from 2004 up to 2019, mainly caused by the decrease of removals in forest land. In 2019, Japan's forests have removed about 55.90 MtC, a decrease of 30.1% and 6.7% below 1990 and 2018 values, respectively.

9. Carbon sequestration by forests in Mongolia has decreased by 5% from 1990 to 2012, mainly driven by forest fires, disease, pests, mining activities and illegal logging. In the Republic of Korea, afforestation has successfully offset carbon emissions with a steady decline of removals by forest land since 2010. According to the NGHGI report, carbon sequestration has steadily decreased from -58.8 MtC in 2010 to -45.6 MtC in 2018. Scientific studies attribute this to ageing trees, and unless replaced, sequestration could drop further into the future. In the Russian Federation, forests are an important carbon sink, which have increasingly sequestered carbon from 1990 to 2010 with the rate declined slowly up to 2019.

### *Grassland emissions*

10. Grasslands represent a significant carbon sink next to forest lands. China has seen increasing storage in grasslands mainly driven by restoration and a ban on grazing in grasslands. As a result, China's grasslands sequestered about 109.16 MtC in 2014 which is a significant increase from -45.13 TgC in 2010. On the other hand, emissions from Japan's grasslands have increased over the years. An increase in manure application coupled with warmer weather was cited as reasons for the increasing trend in CO<sub>2</sub> emissions from grasslands in Japan. Mongolia with a total area of about 792,000 km<sup>2</sup> of grassland, represents a significant carbon stock. However, this potential has been decreasing mainly due to overgrazing. While grasslands in the Republic of Korea have stored carbon, studies suggest that they could turn into carbon sources soon.

### *Cropland emissions*

11. Croplands present a good opportunity for carbon sequestration with an increase in yield if managed well. On average croplands removed 15.3 TgC to 23.98 TgC/year from 1990 to 2010 in China. Emission from Japan's cropland has fallen by 42% compared to 1990 values (8,985 KtCO<sub>2</sub>) mainly due to improved cropland management. However, 2019 emissions showed an increase of over 29.3% from 2018, which needs further investigation. Abandonment of cropland in the Russian Federation has boosted carbon sequestration in cropland due to the growth of

vegetation. Published studies estimated that abandoned farmland sequestered about 42.6 TgC a year, which is equivalent to about 10% of all the Russian forest-based sequestration. Emissions from croplands in the Republic of Korea increased sharply from 1990 value (0.7 TgC) to 4.8 TgC in 2010. It slightly dropped to 3.8 TgC in 2015 but increased to 4 TgC in 2018.

### *Wetland emissions*

12. Besides forest land and grasslands, wetlands are an important carbon pool, however, they have been emitting carbon due to conversion to other land categories. For instance, wetlands in Japan, the Russian Federation and the Republic of Korea emitted 0.02 TgC, 3.02 TgC, and 0.3 TgC, respectively. Japan's emission from wetlands in 2019 stands at 23 KtC and represents a significant decrease (74.1%) from the 1990 and 2018 (14.5%) values.

### *Methodologies and assessment results*

13. Depending on the model and types of data used, assessment results vary. Even the accuracy of reported national data is subject to national statistics and the availability of activity data. The data discrepancy and limitation demand an integrated model, such as IAM and CBM-CFS3, which needs to be further developed to accommodate future requirements such as changes in climate and higher accuracy.

14. The study noted the following assessment gaps: (a) reporting from the LULUCF sector is often incomplete, especially for sub-categories other than forests; (b) language barriers for knowledge sharing and coordination at technical and policy levels; (c) lack of clarity on reporting for activity data for sub-categories, such as land under conversion, which constrains regional comparability of trends in land use changes and subsequent emissions in NEA; (d) lack of scientific studies to assess carbon emissions from LULUCF at country and regional levels; (e) varying definitions, such as forests, wetlands and other lands; (f) lack of evidence-based accounting framework for carbon debits and credits in the land sector; and (g) high variability in estimates due to varying data source and methods.

### *Recommendations*

15. The study highlighted the need for investing in research and expert consultation to develop a common integrated assessment model that is flexible, low risk and does not rely too much on technology to adapt to different economic, environmental, and social conditions in North-East Asia. The study suggested each member State take lead in one area to further develop harmonized methods for estimating carbon emissions from each sub-category of LULUCF.

16. At the technical level, the study recommended the following.

- Improve (a) completeness of reporting, especially in land use categories other than forest land and including disturbances in forest land; (b) reporting of the soil carbon pool, particularly of organic soils, which represent a large carbon store and thus a potential considerable source of GHGs; and (c) clarity on methodology, emission factors, and recalculations related to carbon emissions from LULUCF.
- Identify integrated approaches for reducing carbon emissions from land use and management, and DLD;
- Coordinate on a common approach on the number of land cover types and spatial resolution to be used for generating land use maps; and
- Standardize definitions of LULUCF sub-categories for better comparability.

17. At the policy level, the study recommended the following.

- Strengthen policy and technical cooperation to advance programmes and policies that promote carbon neutrality especially in the LULUCF sector;
- Form a technical expert group to develop harmonized methods;
- Develop a standardized user guide for estimating emissions and sinks from LULUCF using harmonized methods;
- Adopt policies and programmes that retain carbon in high biomass forests, extend harvest cycles, replant and afforestation, changes in forest management to increase the land sink and reduce emissions;
- Improve synergy with other programmes in agriculture, forestry, livestock, urban planning and marine management;
- Strengthen institutional ties and communication between GHG inventory agencies and resource management agencies so that existing data and information can be accessed more easily, and research for new data and methodologies may be developed.

18. The study also suggested member Governments mobilize innovative funding schemes for supporting programmes and activities to enhance carbon sink, reduce land degradation, develop more robust methods for assessing carbon emissions, and enhance knowledge sharing and coordination amongst national sectors and regional countries.

19. To facilitate knowledge sharing amongst experts from North-East Asia on the interlinkage between DLD and climate change, the Secretariat collaborated with the Mid-Latitude Region Network (MLRN) and the OJEong Resilience Institute (OJERI) on a webinar on 15 September 2021 to share key findings of the subregional stock-taking study and solicit expert inputs.

### III. KEY FINDINGS OF THE STUDY ON CLIMATE CHANGE AND DESERTIFICATION, LAND DEGRADATION AND DROUGHT IN NORTH-EAST ASIA

#### *Shifting 'riskscape' in North-East Asia*

20. Under climate change scenarios SSP2-RCP4.5 and SSP5-RCP8.5, the annual average temperature is likely to increase in entire North-East Asia by 2040. The increase is more towards the higher latitude than the sub-tropical region.

- Compared to the 1995-2014 period, the annual average temperature may increase by up to 1.5°C in most of the hyper-arid, arid and semi-arid regions of China, Mongolia and the Russian Federation under the SSP2-RCP 4.5 scenario, excluding some areas.
- Under the SSP5-RCP 8.5 scenario, the annual average temperature in entire hyper-arid and semi-arid regions of China and Mongolia and parts of the Russian Federation is projected to increase by 1.5°C. Higher latitude drylands of the Russian Federation may see up to 2°C increase in annual average temperature.

21. Under climate change scenarios SSP2-RCP4.5 and SSP5-RCP8.5, the annual average precipitation is expected to slightly increase in most parts of North-East Asia. However, the amount of increase in precipitation may not be significant to overcome the existing dry condition. Increasing temperature in the dry areas may intensify the existing risk of desertification.

- Annual average precipitation is expected to decrease in very small areas in the arid and semi-arid regions of eastern Russian Federation, western China and the south-western Tibetan plateau under the SSP2-RCP4.5 scenario.
- Under the SSP5-RCP8.5 scenario, only some parts of western China and the south-western Tibetan plateau may experience a decrease in annual average precipitation.

22. The maximum number of consecutive dry days (CDD) is expected to increase in some of the previously drought-affected areas of North-East Asia.

- CDD is likely to increase up to by 14 days in some of the previously drought-affected areas of central and southwestern China, western Mongolia, and central Japan under SSP2-RCP4.5.
- Under SSP5-RCP 8.5, the spatial distribution of CDD remains almost the same but excludes the areas in central China. The projected increase is likely to reach up to by 15 days.
- Additionally, most of the previously drought-affected areas are projected to experience increasing temperature under both SSP-2RCP 4.5 and SSP5-RCP8.5.
- Increasing the maximum number of CDD as well as the annual average temperature may intensify the existing drought risk in the drought-prone areas of the region.

### ***Potential impacts of intensifying risks in North-East Asia***

23. Population exposure, as a proportion of total population, to intensifying risk of desertification is highest in Mongolia. More than half of Mongolia's agricultural production (in terms of production volume and value), and livestock in arid areas are likely to be exposed to increasing temperature.

24. Population exposure to intensifying risk of drought is highest in the Russian Federation followed by China, Japan, and Mongolia under both SSP2-RCP4.5 and SSP5-RCP8.5. The projected exposure of agricultural production (in terms of production volume and value) and livestock of intensifying drought risk follows the same pattern.

25. Some hyper-arid, arid and semi-arid areas in northern and western China and western Mongolia are projected to have intensifying drought risk. The persistent drought in these dry regions may aggravate the existing desertification risk in this region.

### ***Recommendations***

26. The study highlighted the need (a) to learn and understand the nature, extent, and magnitude of the risk as well as the vulnerability of the society, the environment, and the economy from these risks for addressing the desertification, land degradation and drought risks, (b) to build resilience against evolving complex riskscape, and (c) to develop long-term proactive measures to address intensifying risks of desertification, and land degradation and drought.

27. The study also proposed the following intergovernmental cooperation measures to address the intensifying risks of desertification, land degradation and drought in North-East Asia.

- To tackle the common subregional challenges, it is necessary to scale up the subregional environmental cooperation.
- To promote public-private partnership.
- To ensure rational utilization of resources through strengthening coordination.
- To utilize technology that has great potential in addressing desertification, land degradation and drought risks.
- To connect national actors with the regional experts on desertification, land degradation and drought.



#### **IV. PROGRESS IN THE DEVELOPMENT OF SUBREGIONAL APPROACHES AND ACTIVITIES**

28. Based on the agreement of the SOM-24, the Secretariat had a consultation meeting with the DLDD-NEAN Secretariat on 10 June 2022.

29. Noting the importance of collaboration between the two subregional platforms: NEASPEC and DLDD-NEAN, the meeting discussed how the two platforms can collaborate. DLDD-NEAN Secretariat recommended that NEASPEC focus on addressing DLD issues in connection to other related sectors (tackling the potential causes of DLD), such as water resources management, agriculture, animal husbandry, energy, etc., while DLDD-NEAN addresses DLDD issues within the forestry sector.

30. Building on this recommendation, the Secretariat, jointly with the Ministry of Environment and Tourism of Mongolia, plans to organize an Expert Group Meeting in Ulaanbaatar, Mongolia tentatively in October 2022 (see Annex III). The meeting is expected to discuss a new subregional approach and key activities to address the DLD on the nexus with climate change.

#### **V. ISSUES FOR CONSIDERATION**

31. The Meeting may wish to invite member States to provide guidance on developing a subregional approach of NEASPEC to address desertification and land degradation in connection with climate change.

32. The Meeting may wish to review and approve the proposed activity plan for 2022-2023 (Annex IV).

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