The Government of Japan

Submission on the fifth Global Dialogues in 2025 under the Sharm el-Sheikh mitigation ambition and implementation work programme referred to in paragraph 10 of decision 2/CMA.6

March 2025

Japan welcomes the opportunity to provide views on opportunities, best practices, actionable solutions, challenges, and barriers in line with paragraph 10 of decision 2/CMA.6 relevant to enabling mitigation solutions in the forest sector, selected as the focused topic for the fifth global dialogue under the Sharm el-Sheikh mitigation ambition and implementation work programme (MWP).

1. Roles of the forest-sector to achieve net zero

Forests, covering 31% of the world land area, are home to more than 80%t of all terrestrial species and provide two-thirds of freshwater. Forests store 662 Gt of carbon (The Global Forest Resources Assessment 2020, FAO), which is equivalent to 65 years of 2023 global energy-related CO2 emissions, and are expected to play a significant role as carbon sink such as blue carbon and forests if the world is to achieve net zero by balancing out residual emissions from hard-to-abate sectors with removals.

In reality, the world has lost 178 million ha of forest in the last 30 years. Deforestation and forest degradation act as major driving forces for anthropogenic GHG emissions accounting for about 10% of the world total, thus making the forest an emission source in many developing countries. Halting deforestation and forest degradation is one of the most cost-effective and technically viable mitigation options (IPCC AR6 SYR), and accelerating these efforts is an urgent issue.

Nonetheless, addressing deforestation is not enough. Managing existing forests in a sustainable manner holds significant potential for maximizing the contribution of the forest sector to mitigation solutions. While forest lands are used for supplying wood, which is essential goods for human livelihood and the economy, they can simultaneously fulfill their role as net carbon sink, as keeping the harvest volume within the increment could likely enhance the carbon stock of forest biomass at the landscape level, thus making it possible to manage the production forest without raising atmospheric CO2 concentrations.

In addition, wood products sourced from net-sink forests can be used in various end-use sectors such as industry, building, paper and energy with mitigation potential through long-term storage of carbon in wood products and substitution effects. Using wood products as substitutes for GHG-intensive materials such as steel, concrete and petrochemicals can help reduce supply-chain emissions. Cascading use of harvesting residues such as treetops, processing residues and discarded end-of-life products as feedstocks for bioenergy also contribute to emission reductions through the reduction of fossil fuel consumption.

As stated in paragraph 33 of the outcome of the first global stocktake (GST) (Decision 1/CMA.5), conserving, protecting and restoring terrestrial and marine ecosystems acting as sinks and reservoirs of GHG are also important. Cropland and grassland serve as significant

carbon reservoirs, and blue carbon ecosystems such as seagrass beds (e.g., eelgrass), seaweed beds (e.g., wakame and kelp), tidal wetlands (e.g., salt marshes and tidal flats), and mangrove forests are substantial sinks of GHG in Japan. Assessing and promoting the sequestration capacity of these carbon sinks is needed to enhance the mitigation capacity of the LULUCF sector.

Blue carbon ecosystems contribute not only to climate change mitigation through CO2 sequestration, but also to the conservation of the ocean environment and the development of the local economy including fishery and tourism. Improved soil carbon management in croplands and grasslands can contribute to mitigation and enhanced productivity. From this perspective, Japan would like to emphasize the effectiveness of synergistic approaches in the LULUCF sector for climate change mitigation, biodiversity conservation and the achievement of sustainable development. Regarding the synergistic approaches, the sixth session of the United Nations Environment Assembly (UNEA6) adopted the resolution to promote synergies for national implementation of multilateral environmental agreements[1], including the United Nations Framework Convention of Climate Change (UNFCCC), the Paris Agreement and the Convention on Biological Diversity (CBD). In order to overcome the triple global crisis of climate change, biodiversity loss and pollution, there is a need to promote synergistic solutions.

In sum, the potential of the forest sector as an enabler for net zero should be considered and evaluated not only from the carbon balance perspective within the LULUCF sector but also taking into account possible emission reduction achieved through the substitution effect of wood products as well as co-benefits forests can provide. Japan takes this opportunity to hereunder presents its best practices, actionable solutions, challenges and barriers in relation to the abovementioned narrative as an input to the fifth global dialogue and for consideration of draft CMA decisions on this topic.

2. Halting deforestation and forest degradation

The Glasgow Leaders' Declaration on Forests and Land Use marked a significant milestone when 142 countries endorsed halting and reversing forest loss and land degradation by 2030. As a follow-up towards this goal, the international initiative "Forest and Climate Leaders' Partnership (FCLP)" was launched at COP 27 with the endorsement of 27 countries and regions, including Japan. This initiative engages various activities to halt deforestation and aims to showcase global progress at each COP up to 2030. Noting that the first GST emphasizes the importance of conserving, protecting and restoring nature and ecosystems towards achieving the Paris Agreement temperature goal, including through enhanced efforts towards halting and reversing deforestation and forest degradation by 2030 (para33), good practices on tackling deforestation and forest degradation need to be shared and scaled given the time limitation left for the 2030 target year.

(a) Land use regulatory frameworks in Japan as the base for maintaining forestland

The forest cover in Japan has been constantly maintained at nearly 70% throughout decades and even longer. This is attributed to the enforcement of a variety of regulatory frameworks under the Forest Act in place, including the forest planning system for securing and improving forest resource base, the protection forest system for regulating land use change,

[1] UNEP/EA.6/Res.4 Promoting synergies, cooperation or collaboration for national implementation of multilateral environmental agreements and other relevant environmental instruments

the forest development permission scheme requiring developers of 1 ha or more to get preapproval from prefectural governments, among others. Recently the minimum threshold for the preapproval has been lowered to 0.5 ha for the conversion of forestland to solar panel installments in response to the growing concerns over the land use conflict between forest conservation and solar energy expansion. One of the key takeaways from this experience is that effective regulatory frameworks for land use change backed by appropriate law enforcement are essential for maintaining existing forestland and curbing deforestation.

(b) Technical cooperation on controlling illegal deforestation in the Brazilian Amazon

Japan has a good track record of bilateral cooperation in tackling deforestation. One example is a project to improve control of illegal deforestation through a combination of advanced satellite imagery and AI technologies in the Brazilian Amazon. The project aims to strengthen measures and build capabilities for the detection and prediction of illegal deforestation using radar satellite and AI technologies in the Brazilian Legal Amazon area, which has the largest tropical forest and is one of the hot spots of deforestation in the world. The outcome of the project has been shared with other countries in the Amazon region and beyond, paving the way for constant monitoring of activities in forests globally.

(c) Capacity building for policy makers to enforce anti-deforestation policy

Japan has partnered with FAO to develop e-based platform and provide training modules for learning effective measures to halt deforestation and decouple agricultural supply from deforestation. By conducting a cost benefit analysis of related policies in Ghana and DRC, it offers verity of solutions that are accessible globally from e-based materials, the training modules cater to governments seeking to navigate the intricacies of deforestation challenges specific to their circumstances.

3. Conservation and enhancement of forest carbon sink

After experiencing severe forest degradation through exploitative resource use, Japan launched a nationwide reforestation programme during the 1950s and has now succeeded in restocking the forest resources to the maturity level. Although the programme was not aimed to address climate change at the beginning, but rather devastating floods, slides and debris flow taking a heavy toll of human lives and properties every year as well as the expanding gap between domestic wood supply potential and demand for wood gave nationals a push for forest rehabilitation, this whole process brought about the secondary effect of enhancing carbon sinks and reservoirs. Consequently, the growing stock of forest has increased significantly over the past 50 years, and this scale of increase in forest biomass is translated into massive successful sequestration of atmospheric CO2 into forest ecosystems.

While CO2 removals by forest are in a declining trend due to the maturity of forests, Japan's annual GHG inventory reports show that the forest has consistently been a net carbon sink since the first commitment period of the Kyoto Protocol. 45.7 Mt CO2 of removals by forest including the harvested wood products (HWP) carbon pool was accounted for in 2022.

Japan announced its new NDC in February 2025. The new reduction targets are on a straight line and path toward achieving net zero by 2050. Specifically, Japan aims to achieve a 60% reduction by FY 2035 and a 73% reduction by FY 2040, compared to levels in FY 2013. These ambitious targets are firmly aligned with the 1.5-degree goal. Of this amount, 72Mt-CO2 of removals by forest is expected to be achieved through the below-mentioned measures. This new

forest removal target is subject to the shift of the estimation method of carbon stock change in living biomass from the one using a growth table for different tree species to another directly measuring the growing stock based on a systematic sampling survey.

Regarding in blue carbon, in 2024, removals in seagrass meadows and seaweed beds were estimated and reported (approximately 0.35 Mt in FY2022). The amount absorbed in seaweed beds was reported for the first time in the world. The IPCC Guidelines provide methodologies for calculating emissions and removals in three ecosystems: mangroves, tidal marshes, and seagrass meadows, but no methodology is provided for macroalgal beds. Japan is studying an original model to evaluate carbon sequestration in both macroalgal beds and seagrass meadows.

(a) Integration of the basic mid-term forest policy into the national climate change mitigation strategy

The Basic Plan for Forest and Forestry developed once every five years sets out key policies and measures to ensure sustainable forest management and enhancement of forest carbon sinks and reservoirs, such as appropriate thinning and reforestation after final harvesting, deployment of fast-growing variations, protection of saplings and seedlings from deer feeding damage, protection of forests from storms, wildfires, pests and disease and other natural hazards such as earthquake by preventive erosion control and civil engineering to stabilize hillsides. These measures are integrated as a comprehensive set of forest carbon sink policies in the updated Plan for Global Warming Countermeasures (Cabinet decision on February 18. 2025), Japan's climate change mitigation master plan forming the basis of its NDC.

(b) Carbon Crediting (J-credit Scheme)

The J-Credit Scheme is a government-operated carbon crediting programme that certifies the verified amount of GHG emissions reduced and removals by sinks achieved through the implementation of validated projects. Three methodologies are in place for forest carbon removals, namely, forest management, afforestation and reforestation for additional forest management activities. Through this scheme, credit purchasers can publicly demonstrate their contributions to sustainable forest management and ecosystem conservation, while forest managers can raise funds for further forest management through credit sales. Under the growing need for removal credits to achieve net zero, scaling up the generation of forest-based credits has been achieved in the last few years with forest owners and managers coming to recognize the merits of the scheme. Since the launch of the scheme in FY 2013, a cumulative total of 1.4 Mt-CO2 of units has been issued from projects under the forest methodologies.

4. Expanding sustainable wood use for the enhancement of product carbon sinks and substitution effects

Use of wood produced from sustainably managed forest areas with net carbon sink for various applications can have considerable potential for climate change mitigation in two ways; expanding product carbon storage outside of forests and reducing carbon emissions through substituting GHG-intensive materials or fossil fuels. Japan is undertaking a number of measures in order to promote sustainable wood use as part of its climate change mitigation policy.

(a) An Act for Promotion of Use of Wood in Buildings to Contribute to the Realization of a Decarbonized Society

The Japanese government enacted the Act for Promotion of Use of Wood in Public Buildings in 2010, and accordingly 31% of low-rise public buildings were constructed with wood structure on floor-space base in 2023, up from 18% in 2010. This act was amended in 2021 to expand its scope to private buildings when the title of the law was changed to the “The Act for Promotion of Use of Wood in Buildings to Contribute to the Realization of a Decarbonized Society”. The amended act has set out basic policy for wood use stipulating that wood use be promoted in a way that ensures long-term carbon removals by forests including through reforestation after final harvest and enhances substitution effects by replacing other materials and fossil resources with a higher carbon footprint. The amended act has also introduced an agreement system under which private entities can sign up a contract with the central government ministry(ies) or local government(s) for cooperatively promoting wood use and thereby getting technical advice. In addition to the enactment of the law, the Building Standard Act and its application have been revised, expanding the potential for the use of wood in buildings.A suite of policy measures created an enabling environment for wooden mid- to high-rise buildings backed by the development of high-strength and fire-resistant wood elements.

(b) Development of calculation tools for carbon storage in buildings and embodied carbon of wood products

The Forestry Agency of Japan released a guideline for the labeling of carbon stored in wood used for buildings in 2021. The guideline provides a tool for estimating carbon stored in wood used for buildings with an Excel format calculation sheet.

The Institute for Built Environment and Carbon Neutral for SDGs released in 2024 Japan Carbon Assessment Tool for Building Lifecycle, J-CAT[2], that helps estimate whole life GHG emissions of buildings covering all stages from production of building materials to in use and to disposal. While several LCA tools in the building sector have been developed internationally, J-CAT has the advantage of being easy to use for domestic users, with a full range of product data distributed in Japan. With this tool, the reduction of embodied carbon in buildings when using wooden materials as the main element can be quantified and visualized.

One example of an 11-story mixed-structure building shows 610 t CO2 equivalent of carbon is stored, and 1,380 t CO2 of emission reduction was achieved in comparison to the same size building that would have been built with a reinforced concrete frame structure, which it made the calculation using the existing tools.

(c) Development of wood-based bioplastic

Applications of wood biomass in chemical products also has the potential to reduce CO_2 emissions through substitution effects by replacing petrochemical products. Forestry Agency has been supporting the development of wood-based new materials.

One of the primary components of trees, lignin, exhibits varied properties depending on the tree species, growth environment, and part of the tree, which complicates its use as an industrial material. However, by focusing on the relatively uniform chemical structure of Japanese cedar, a research team from Japan's industry-academia-government collaboration has developed a technology to produce "glycol lignin," which serves as a raw material for high-performance plastics. Glycol lignin is highly processable, heat-resistant, and can be

[2] https://www.ibecs.or.jp/english/index.html

combined with various materials to serve as a raw material for diverse products, including high-heat-resistant plastics and fiber-reinforced plastics (FRP). Currently, in collaboration with private companies, research institutions, and local governments, efforts are underway to scale up for commercialization and develop applications, while conducting LCA evaluations on the climate change mitigation effects.

(d) Scaling up woody biomass for energy use

Since the introduction of the feed-in tariff scheme in 2012, the number of power generation facilities using woody biomass derived from thinned wood as main feedstock has increased to 159 facilities with a total generation capacity of 596 MW (September 30, 2023). The use of woody biomass for heat or combined heat and power is also being promoted. Deployment of wood-based bioenergy contributes to not only emission reduction through shifting away from fossil fuels, but also economic gains through the monetization of residues and low-grade wood that would have been otherwise simply wasted, improving energy security through the use of local resources available and building resilience in times of lifeline damage due to disasters.

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