Indicator 15.2.1

Indicator Name, Target and Goal

Indicator 15.2.1 Progress towards sustainable forest management

Target 15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

Goal 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Definition and Rationale

○ Definition

This indicator measures progress towards sustainable forest management (SFM). The indicator comprises five sub-indicators:

(1) Forest area net change rate;

(2) Above-ground biomass stock in forest;

(3) Proportion of forest area located within legally established protected areas;

(4) Proportion of forest area under a long-term forest management plan; and

(5) Forest area under an independently verified forest management certification scheme.

○ Concepts

Sustainable forest management is defined as a "[a] dynamic and evolving concept [that] aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations" (Resolution A/RES/62/98).

Sub-indicator 1: Forest area net change rate

Forest is defined as land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ*, according to Global Forest Resources Assessment (FRA) published by Food and Agriculture Organization of the United Nations (FAO)*. It does not include land that is predominantly under agricultural or urban land use. Additional detailed criteria are listed in FAO's Global Forest Resources Assessment

(FRA) 2020 Terms and Definitions Document available at
http://www.fao.org/3/I8661EN/i8661en.pdf.

The indicator is calculated based on forest area, whose definition
is the same   as reported to FRA (see indicator 15.1.1).

Sub-indicator 2: Above-ground biomass stock in forest

Above-ground biomass is defined as all living biomass above the
soil, including stem, stump, branches, bark, seeds and foliage,
according to FRA. In cases where forest understory is a relatively small
component of the aboveground biomass carbon pool, it is acceptable
to exclude it, provided this is done in a consistent manner throughout
the inventory time series.

Japan defines above-ground biomass stock in forest as the sum
of biomass stock including trunk and branches of standing trees,
Biomass stock can be estimated by multiplying the growing stock of
forest with standing trees (m^3) by biomass expansion factor by a ratio
of above-ground parts by wood density(t/m^3 dry matter).

Sub-indicator 3: Proportion of forest area located within legally established protected areas

Forest area within protected areas refers to forest area within
formally established protected areas independently of the purpose for
which the protected areas were established and includes International
Union for Conservation of Nature (IUCN) categories I-IV:
  - Category Ia: Strict nature reserve
  - Category Ib: Wilderness area
  - Category II: National park
  - Category III: Natural monument or feature
  - Category IV: Habitat/species management area.
They are clearly identified areas where managed / administrated by
laws or other effective measures for the purpose of biodiversity
conservation and sustainable use of ecosystem services.

Specifically, National Park, Quasi-National Park and Prefectural
Natural Park under National Park Law, Wildness Conservation Area and
Nature Conservation Area under Nature Conservation Law, Natural
Habitat Protection Area under Law on Conservation of Endangered
Species of Wild Fauna and Flora, and National Forest Reserve and
Green Corridor under Law Concerning Utilization of National Forest

Land, Natural Seashore Conservation Area under Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea, Suburban Green Conservation Area under Law for the Conservation of Suburban Green Zones in the National Capital Region and Law for the Development of Conservation Area in Kinki Region, Green Conservation Area under Urban Green Space Conservation Law, Natural Monument under Law for Protection of Cultural Properties, and other protected area designated by bylaw of prefecture government, in Japan.

Sub-indicator 4: Proportion of forest area under a long-term forest management plan

Forest area with management plan refers to forest areas that have a long-term documented management plan, aiming at defined management goals, which is periodically revised. It may refer to forest management unit level or aggregated forest management unit level (forest blocks, farms, enterprises, watersheds, municipalities, or wider units). It also includes forest areas that are within protected areas with management plan.

A management plan must include adequate detail on operations planned for individual operational units (stands or compartments) but may also provide general strategies and activities planned to reach management goals.

It is defined as area under "Regional Forest Plan" and "Forest management Plan for National Forest", in Japan.

Sub-indicator 5: Forest area under an independently verified forest management certification scheme

Independently verified forest management certification refers to forest area certified under a forest management certification scheme with published standards and is independently verified by a third-party.

The total area of forests under FSC and SGEC (including mutually recognized area with PEFC) are reported.

○ Rationale and Interpretation
The five sub-indicators contribute to the measurement of progress in SFM in various ways:

Sub-indicator 1: Forest area net change rate

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Trends in forest area are crucial for monitoring SFM. The first sub-indicator focuses on both the direction of change (whether there is a loss or gain in forest area) and how the change rate is changing over time; the latter is important in order to capture progress among countries that are losing forest area, but have managed to reduce the rate of annual forest area loss.

Sub-indicator 2: Above-ground biomass stock in forest

Changes in the above-ground biomass stock in forest indicate the balance between gains in biomass stock due to forest growth and losses due to wood removals, natural losses, fire, wind, pests and diseases.

Sub-indicator 3: Proportion of forest area located within legally established protected areas

The change in forest area within legally protected areas is a proxy for trends in forest biodiversity conservation and a clear indication of the political will to protect and conserve forest biodiversity.

Sub-indicator 4: Proportion of forest area under a long-term forest management plan

The fourth sub-indicator looks at the forest areas that are under a long-term forest management plan. An increasing area under forest management plan is an indicator of progress towards sustainable forest management.

Sub-indicator 5: Forest area under an independently verified forest management certification scheme

The fifth sub-indicator is the forest area that is certified by an independently verified forest management certification scheme. An increase in certified forest area provides an additional indication of progress towards sustainable forest management.

Data Sources and Collection Method

Data below are used for reporting.

Sub-indicator 1: Forest area net change rate

Forest area in Japan are counted from "Survey on the State of the Forest Resources".

Point of time: As of March 31 in 2007, 2012, 2017, and 2022

Methodology: Forestry Agency aggregated the areas of national forests (forests owned and managed by Forestry Agency and other ministries or agencies), based on the information (such as forest register) which was utilized for establishment of Forest Management Plan for National Forest. Prefectural governments aggregated the area of private forests, based on the information which was utilized for establishment of Regional Forest Plan. And Forestry Agency compiled the area of national and private forests.

The Regional Forest Plan and Forest Management Plan for National Forest, which have been established in previous years of the survey, are aggregated after reflecting appropriate adjustment of secular changes (such as changes in age, area caused by harvest, planting and land use conversion areas, growing stock and volume increment) to the values gained in the year of their establishment.

Sub-indicator 2: Above-ground biomass stock in forest

Forestry Agency aggregated the growing stock of national forests (forests owned and managed by Forestry Agency or other ministries and agencies), based on the information (such as forest register) which was utilized for establishment of Forest Management Plan for National Forest. Prefectural governments aggregated the growing stock of private forests, based on the information which was utilized for establishment of Regional Forest Plan. And Forestry Agency compiled the growing stock of national and private forest.

Biomass stock is estimated by multiplying the growing stock of the forests with standing trees by biomass expansion factor by a ratio of above-ground parts by wood density. Biomass expansion factor and wood density used for estimating biomass stock are based on "National Greenhouse Gas Inventory Report of Japan".

Sub-indicator 3: Proportion of forest area located within legally established protected areas

Forest area within protected areas is aggregated from amount of forest areas as following (overlapped areas are depleted): National Park, Quasi-National Park and Prefectural Natural Park under National Park Law, Wildness Conservation Area and Nature Conservation Area under Nature Conservation Law, and National Forest Reserve and Green Corridor under Law Concerning Utilization of National Forest Land.

Sub-indicator 4: Proportion of forest area under a long-term forest management plan

Forest area under Regional Forest Plan and Forest Management Plan for National Forest in Survey on the State of the Forest Resources is calculated as "forest area under a long-term forest management plan".

Sub-indicator 5: Forest area under an independently verified forest management certification scheme

The data for this sub-indicator are collected from each certification body (FSC and SGEC).

Method of Computation and Other Methodological Considerations
○ Computation Method

Sub-indicator 1: Forest area net change rate

This indicator is calculated using a compound interest formula to determine the annual net change rate.

$$q = \left[\left(\frac{A_2}{A_1} \right)^{1/(t_2 - t_1)} - 1 \right] \times 100$$

Where:
A1 is forest area for year t1 and A2 is forest area for year t2.

Sub-indicator 2: Above-ground biomass stock in forest

The formula is given as follows:

$$\frac{above-ground\ biomass\ stock\ in\ forest\ \ (tonnes)}{total\ forest\ area\ \ (ha)}$$

Biomass stock can be estimated by multiplying the growing stock of forest with standing trees by biomass expansion factor by a ratio of above-ground parts by wood density. Biomass expansion factor and wood density used for estimating biomass stock are based on "National Greenhouse Gas Inventory Report of Japan (2023)" which was compiled by National Institute for Environmental Studies Greenhouse Gas Inventory Office (GIO) under the supervision of Ministry of the Environment.

Sub-indicator 3: Proportion of forest area located within legally established protected areas

Percentage of forest area located within legally established protected areas is calculated as:

$$\frac{forest\ area\ within\ legally\ established\ protected\ areas\ (ha)}{total\ forest\ area\ (ha)} \times 100$$

Sub-indicator 4: Proportion of forest area under a long-term forest management plan

Percentage of forest area under a long-term forest management plan is calculated as:

$$\frac{forest\ area\ under\ a\ long\ term\ forest\ management\ plan\ (ha)}{total\ forest\ area\ (ha)} \times 100$$

Sub-indicator 5: Forest area under an independently verified forest management certification scheme

The data for this sub-indicator are collected from each certification body (FSC and SGEC).

○ Comments and limitations

Sub-indicators which include forest area in computation method (sub-indicator 1 - 4) are calculated for the year when the Survey on the State of the Forest Resources had been conducted (2012, 2017, and 2022). FAO's report for these sub-indicators may include values in the years which the survey has not been conducted. These values are estimated along the method indicated by FAO.

Sub-indicator 1: Forest area net change rate

Survey on the State of the Forest Resources is conducted every five years. Computed values are average forest area net change rate between 2007 and 2012, between 2012 and 2017, and between 2017 and 2022 when survey is conducted.

Sub-indicator 2: Above-ground biomass stock in forest

Biomass stock is not directly measured and thus such data do not

exist. Above-ground biomass stock can be estimated by multiplying the growing stock of forest with standing trees by biomass expansion factor by a ratio of above-ground parts by wood density. Biomass stock in dead wood, litter and soil is not estimated.

Sub-indicator 3: Proportion of forest area located within legally established protected areas

Forest area within protected areas is counted up from amount of forest areas as following, taking into account of data availability (overlapped areas are depleted): National Park, Quasi-National Park and Prefectural Natural Park under National Park Law, Wildness Conservation Area and Nature Conservation Area under Nature Conservation Law, and National Forest Reserve and Green Corridor under Law Concerning Utilization of National Forest Land.

Sub-indicator 4: Proportion of forest area under a long-term forest management plan

Area of forests under Regional Forest Plan and Forest Management Plan for National Forests are calculated as forest area under a long-term forest management plan. The area is equal to the forest area reported for indicator 15.1.1.

Sub-indicator 5: Forest area under an independently verified forest management certification scheme

The total area of forests under FSC and SGEC (including mutually recognized areas with PEFC) are reported. Under the national scheme, "Forest Management Plan" for the purpose of promoting fulfillment of multiple functional roles of forests through efficient forest management and conservation is formulated by private forest owners or persons entrusted by forest owners and certified among private forests. Area of forests under the Forest Management Plan is shown as reference.

Proxy, alternative and additional indicators

N/A

Data Disaggregation

N/A

References

Survey on the State of the Forest Resources
（2007）　http://www.rinya.maff.go.jp/j/keikaku/genkyou/h19/
（2012）　http://www.rinya.maff.go.jp/j/keikaku/genkyou/h24/
（2017）　http://www.rinya.maff.go.jp/j/keikaku/genkyou/h29/
（2022）　http://www.rinya.maff.go.jp/j/keikaku/genkyou/r4/

National Greenhouse Gas Inventory Report of Japan
Japanese　https://www.nies.go.jp/gio/archive/nir/jqjm1000001v3c7t-att/NIR-JPN-2023-v3.0_J_gioweb.pdf
English　https://www.nies.go.jp/gio/archive/nir/jqjm1000001v3c7t-att/NIR-JPN-2023-v3.0_gioweb.pdf

Custodian Ministries of Data
　　　　Forestry Agency, Ministry of Agriculture, Forestry and Fisheries

Custodian Ministries of Related Policies
　　　　Forestry Agency, Ministry of Agriculture, Forestry and Fisheries
　　　　Ministry of the Environment

International Organization
　　　　Food and Agricultural Organization (FAO)