

CRITERION 7

LEGAL, INSTITUTIONAL AND ECONOMIC FRAMEWORK FOR FOREST CONSERVATION AND SUSTAINABLE MANAGEMENT



Criterion Seven relates to the overall economic, legal, institutional, and policy environment of a country. This Criterion provides a context for the consideration of Criteria One to Six.

Legislation, institutional capacity and economic arrangements, with associated policy measures at both national and sub-national levels, create an enabling environment for the sustainable management of forests. Reporting against these indicators contributes to raising public and political awareness of issues affecting forests and builds support for their sustainable management.

7.1 LEGAL FRAMEWORK

All countries possess a legal framework, which includes the body of laws and customary rules that direct the actions of their citizens. In some countries there are also sub-national levels of government that contribute to this legal framework. The conservation and sustainable management of forests can be greatly assisted if the national, or appropriate sub-national, legal framework includes elements relating to forests and their use. This criterion lists five areas where indicators, relevant to the legal system, can be established to demonstrate their contribution to sustainable forest management.

Extent to which the legal framework (laws, regulations and guidelines) supports the conservation and sustainable management of forests, including the extent to which it:

INDICATOR 7.1.a

**Clarifies property rights,
provides for appropriate land tenure arrangements,
recognizes customary and traditional rights of indigenous people, and
provides means of resolving property disputes by due process**

Rationale

This indicator measures the extent to which the legal system addresses the issues relating to property rights and land tenure to forested land, including those of indigenous people. Stable property rights, security and certainty of ownership, and the assurance that these rights can be protected or disputed through due process are important for sustainable forest management. People or communities with secure land tenure or property rights are likelier to promote long-term sustainable forest management. In addition, people or communities who are dependent on or have a long association with particular forest areas often assume a higher level of stewardship for forests.

Current State and Trend

The property rights are fully secured under the Constitutions in Japan. In order to clarify the principles of the ownership of land, including forests the Civil Code is provided. The process to resolve the dispute over ownership is stipulated in the procedure laws, including the Civil Procedure Act. A legal framework to secure the ownership and the process to resolve property disputes, which constitute a basis of forest management, exists in Japan.

INDICATOR 7.1.b

Provides for periodic forest-related planning, assessment, and policy review that recognizes the range of forest values, including co-ordination with relevant sectors

Rationale

This indicator addresses whether there is a legal framework that provides for forest-related planning, assessment and policy review. Forests are affected by a wide variety of influences, including many beyond the forest sector such as agriculture, transportation, energy, pollution, trade, and fiscal policies. Sustainable forest management is dependent on societies having the means to:

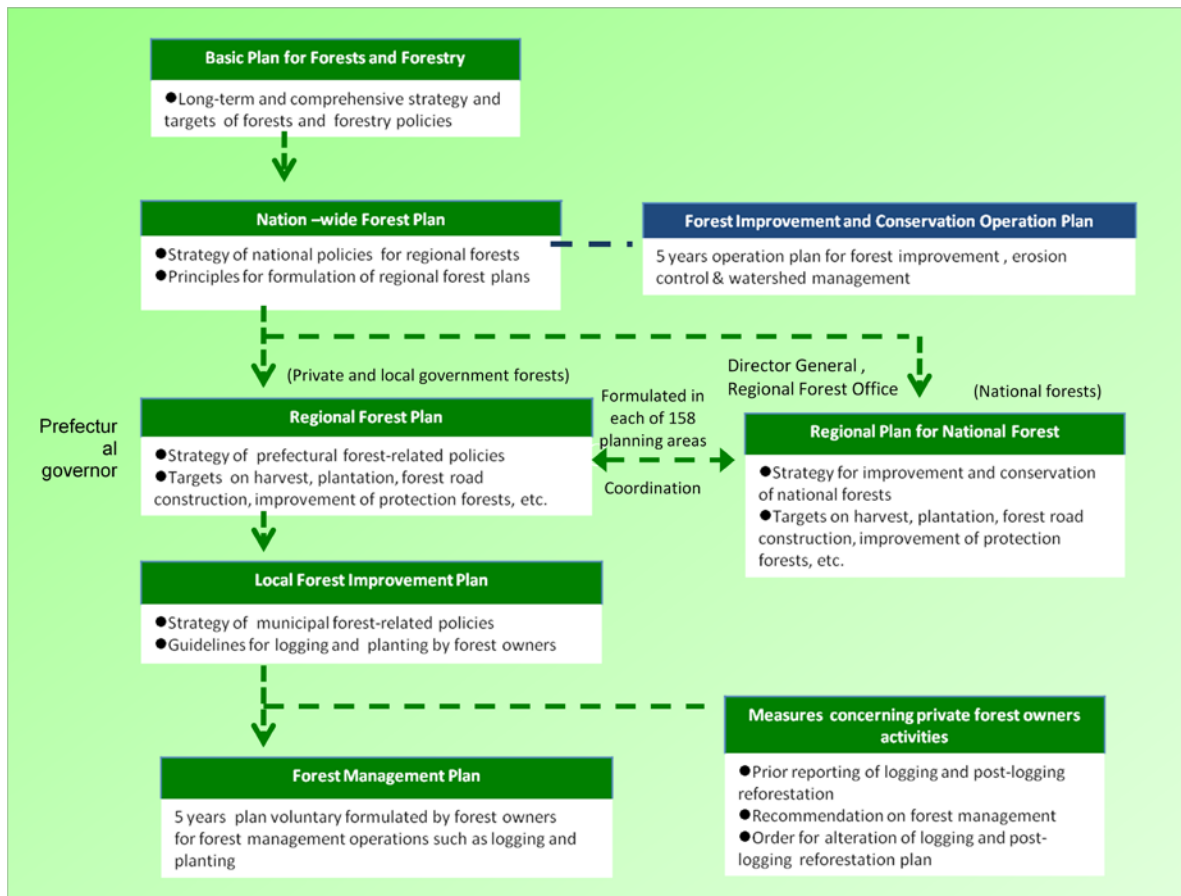
- Recognize environmental, social and economic conditions;
- Identify trends within and outside the forest sector that affect forests;
- Plan for the effective management of the full range forest values; and
- respond to needed change.

Current State and Trend

The principles of the Japan's policies on forests and forestry are laid down by the Forests and Forestry Basic Act which was fully renovated in 2001 in light of the international trends in pursuit of the sustainable forest management. In accordance with the Act, the Basic Plan for Forests and Forestry is formulated by the national government in order to ensure the concerted and progressive implementation of the policy measures for sustaining the multiple benefits from forests and steady and sound development of forestry.

Based on the Basic Plan, forest management plans are formulated at the national, district, municipal and management unit levels in a consistent manner the national and local governments and forest owners respectively in accordance with in the Forest Act. In each forest management plan, goals and management principles for the improvement and conservation of forests are identified.

Figure 86: Structure of forest management planning system



Sources: Forestry Agency

INDICATOR 7.1.c

Provides opportunities for public participation in public policy and decision-making related to forests and public access to information

Rationale

Forests may be managed more sustainably if citizens and communities have the responsibility and opportunity to actively influence and contribute to policies and programs for sound forest management. Public participation can in turn foster practical and political support for sustainable management. Timely public access to accurate information will enhance this participatory process.

Current State and Trend

The Forest Act stipulates that the national and local governments publicly open the draft of forest management plans and submit them to their respective advisory councils comprising the representatives of stakeholders for their recommendations. In the case of district and municipal forest management plans, which have closer link to the livelihood of local people and communities, the Forest Act further requires the local governments to publicize the draft for citizens' opinions and to report the advisory council on how the submitted opinions are reflected.

The Forest Act also provides a procedure for the interest citizens to appeal to the concerned national or prefectured governments for the designation or cancellation of protection forests. Once forests are designated as protection forests, certain forest operations such as logging are restricted for the protection of environmental benefits to the public.

Table 5: Legal arrangements for public information access and opinions

Category of plans	Related arrangements
Basic plan for forests and forestry	* Consultation with the Forestry Administration Council comprised of authorities in related areas when formulating the plan
	* Report to the Parliament and public release of the formulated plan
Nation-wide forest plan	* Consultation with the Forestry Administration Council and invitation of opinions from prefectural governors when formulating or amending the plan
	* Public release of the formulated or amended plan
Regional forest plan	* Public release of the draft and invitation of public opinions when formulating or amending the plan
	* Consultation of the draft with the prefectural forestry administration council
	* Public release of the formulated or amended plan
Local forest improvement plan	* Public release of the draft and invitation of public opinions when formulating or amending the plan
	* Public release of the formulated or amended plan as well as the contents of public opinions and the responses to them
Protection forests	* Invitation of opinions and holding of hearings from stakeholders when designating or canceling protection forests

Sources: Forest Act

INDICATOR 7.1.d

Encourages best practice codes for forest management

Rationale

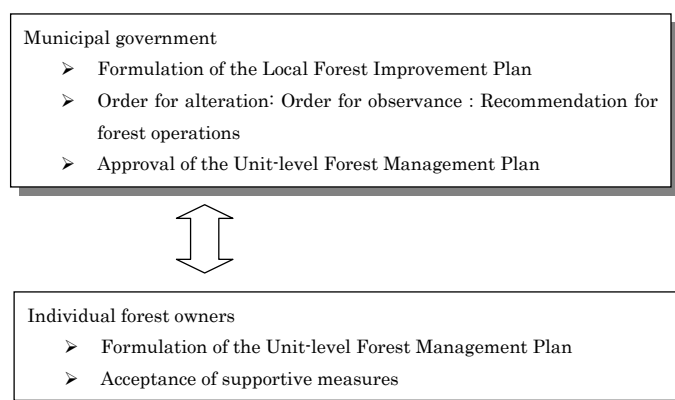
Best management codes of practice set standards and stipulations governing forest planning, management and operational activities on the ground. The presence of, and adherence to, such codes is integral to achieving forest sustainability.

Current State and Trend

The norms of the forest management practices to be observed by forest owners are laid down by the municipal forest management plans in accordance with the Forest Act. In case the notified logging or post-logging reforestation practices are regarded as inappropriate in light of the norms, the municipal government can issue an order for alternation. The municipal government can also issue a recommendation to the forest owner for necessary forest operations if the principles provided by the municipal forest management plan are not observed and, as a result, the achievement of the municipal forest management plan is to be hindered.

The unit level forest management plans, which are voluntary formulated by individual forest owners are approved by the municipal governments if the plans satisfy the principles set out by the respective municipal forest management plans. A variety of supportive measures are provided for encouraging the implementation of the planned forest management practices.

Figure 87: Legal framework for encouraging forest management practices



Sources: Forest Act

INDICATOR 7.1.e

Provides for the management of forests to conserve special environmental, cultural, social and/or scientific values

Rationale

In order to help conserve unique or otherwise special social, cultural, ecological, scientific and environmental values, formal legal mechanisms may be needed. Legal mechanisms appropriate for the conservation of special values are diverse. The absence, however, of any legal framework supporting the management of special forest values and their long-term sustainability may result in their loss.

Current State and Trend

Based on a variety of legislations, such as the Forest Act, Natural Park Act and Wildlife Protection and Hunting Act, a range of specific legal mechanisms, including protection forests, natural parks and wildlife reserves, has been developed in Japan in order to provide appropriate land management practices in response to the society's diversified needs for conserving the environmental, cultural, social and scientific values of forests.

For the protection of the environmental and conservation values of forests, in particular, protection forests are designated and the forest operations are restricted to some extent in accordance with the Forest Act.

Table 6: Legal mechanisms to conserve special environmental, cultural, social and scientific values of forests

Category	Item	Category	Item
Protection forest	Headwater conservation	Forestry seeds and seedlings	Special seed tree, Special seed tree forest
	Soil conservation	Nature conservation	Wilderness area
	Erosion control		Special area
	Shifting sand control	Nature park	Special area
	Windbreak	Wildlife protection	Special protection area
	Flood control	Conservation of endangered species	Restricted area
	Tide damage prevention	Cultural properties protection	Historic sites, scenic spots and natural monuments
	Drought prevention	Scenic beauty	Scenic zone
	Snow damage prevention	Greenbelt	Conservation area of greenbelt
	Mist mitigation		Special conservation area of greenbelt
	Avalanche prevention	Historic scenery	Special conservation area of historic scenery
	Stone crumbling prevention	Erosion control and watershed management	Designated area for erosion control
	Firebreak	Landslide prevention	Slagheap-landslide prevention area
	Fish trap	Prevention of steep slope failure	Steep slope failure danger zone
	Navigation target	Landmark for fisheries	Landmark stand for fisheries
	Public health provision		
	Historical and scenic site conservation		
Area of protection works	Area of protection works		

Sources: Forest Act etc.

Table 7: Legal restriction on logging operation

Restriction	Item
Prohibition of logging	◆ Protection forest (only forest whose function may be seriously hindered by logging)
	◆ Special seed tree, special seed tree forest
	◆ Wilderness area
	◆ Special protection area and 1st category special area of national and quase-national park
Advance permission of logging	◆ Designated tree and tree within wildlife protection facilities in special protection area of wildlife protection area
	◆ Protection forest (except for forest where logging is prohibited or where advance notification of logging is required)
	◆ Special area within nature conservation area
	◆ special area within national or quase-national park
	◆ Special protection area within wildlife protection area
	◆ Special conservation area of greenbelt
	◆ Historic sites, scenic spots and natural monuments
	◆ Special conservation area of historic scenery
Advance notification of logging	◆ Designated area for erosion control
	◆ Slagheap-landslide prevention area
	◆ Protection forest (in case of only thinning or selective cutting within planted forest where these operations are allowed by regulation)
	◆ Conservation area of greenbelt

Sources: Forest Act etc.

7.2 INSTITUTIONAL FRAMEWORK

Within the overall legal framework, countries possess a diversity of national and sub-national institutions that have responsibility for implementing government and private policies and programs that can promote sustainable forest management. These institutions can integrate public needs and aspirations into the policy-making process and should be encouraged on an ongoing basis. Individuals within these institutions need the skills and the means to ensure that policies and programs are implemented. A wide variety of skills are needed within institutions if they are to meet the diversity of needs of societies from forests. On-going development and maintenance of these skills are also required if institutions are to be effective. Planning, implementation, and enforcement activities should be open and transparent to provide evidence of a country's commitment to sustainability. The degree to which institutions are in place and functioning on a continuous basis can also indicate their potential to promote sustainability.

Extent to which the institutional framework supports the conservation and sustainable management of forests, including the capacity to:

INDICATOR 7.2.a

Provide for public involvement activities and public education, awareness and extension programs, and make available forest-related information

Rationale

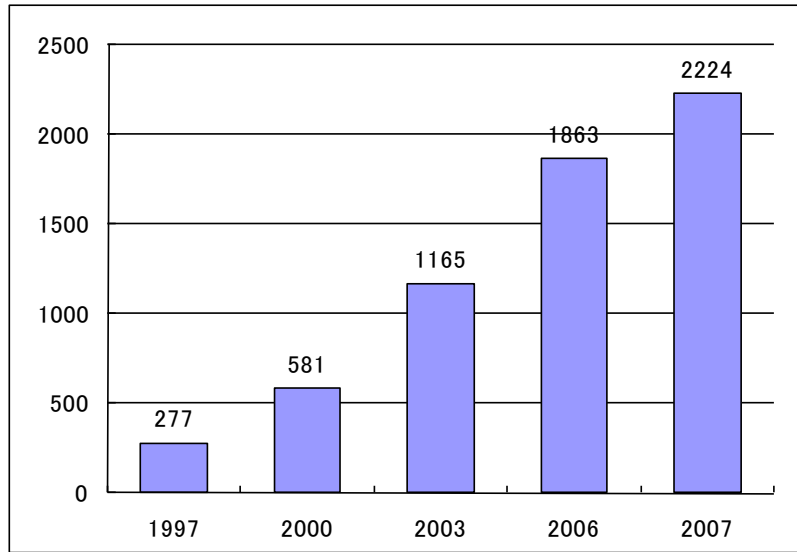
A well-informed and knowledgeable public promotes civic participation in forest activities, contributes valuable ideas and information, and is a foundation of support for sustainable forest management.

Current State and Trend

More than two thousand groups of volunteers are involved in a variety of forest-related activities, such as the improvement and conservation of neighboring forests, environmental education and the interchange between local communities and cities in 2007. The number of such voluntary group has constantly increased reflecting the uplifting public interests in forest development.

The Basic Plan for Forests and Forestry adopted by the Cabinet in 2001 encourages the public involvement in the activities related to the improvement, conservation and use of forests, as well as the further pursuit of the publicly informed forest management. Based on the Plan, supportive measures to provide the forest volunteer groups with planting field and materials have been prepared. Certification of experts, including forest instructors, that provide the recreational users with useful information, and tree doctors, has been carried out as well.

Figure 88: Change in the number of volunteer groups



Sources: Forestry Agency, White Paper on Forest and Forestry

INDICATOR 7.2.b

Undertake and implement periodic forest-related planning, assessment and policy review, including cross-sectoral planning and co-ordination

Rationale

This indicator measures the capacity of institutions to undertake planning and reviews and to co-ordinate these with other relevant sectoral activities. Effective sustainable forest management requires both the existence and application of formal procedures for planning forest activities, assessing the effectiveness of forest management activities, reviewing forest policies ensuring that forest policies and plans are co-ordinated with other sectors, and the implementation of needed changes.

Current State and Trend

The Basic Plan for Forests and Forestry is revised in every five years, by the natural government in principle taking into account the conditions surrounding forests and forestry, as well as the results of the assessment of policy measures implemented under the preceding plan. A series of forest management plans are also formulated in every five years based on the Basic Plan, and revised whenever required, even within the duration of current plans, according to the changes in circumstances.

The national forest management plan, which is formulated by the Minister for Agriculture, Forestry and Fisheries, is finalized by the adaption of the Cabinet followed by the consultations with the relevant ministries and agencies. To formulate or revise district and municipal forest management plans governors or mayors consult with the government offices in charge of the related sectors, such as environment, land use and erosion control, in accordance with the Forest Act.

Figure 89: List of government offices to be consulted in prior to the formulation or revision of national forest plan

- Consultation with port administration authority (in case of waterfront area)
- Coordination with local government offices in charge of environment, land-use, road, labor and public safety
- Opinion hearing from Regional Bureau of Economy, Trade and Industry

Sources: Forestry Agency

INDICATOR 7.2.c

Develop and maintain human resource skills across relevant disciplines

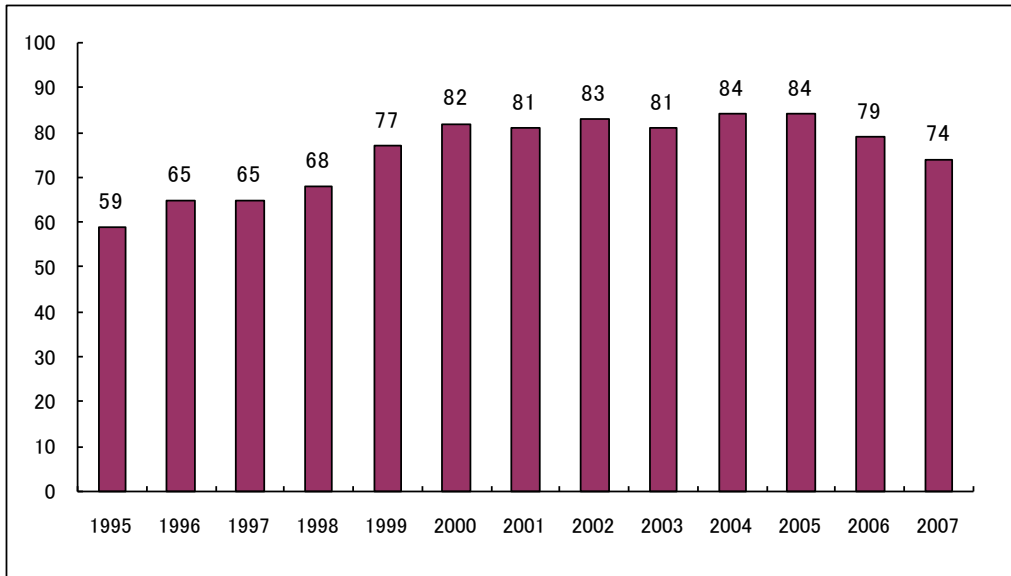
Rationale

This indicator measures the extent to which institutions demonstrate the capacity and commitment to develop and maintain the essential skills of their staff. A broad range of disciplines and skills is necessary to achieve the goals of sustainable forest management, including research, management, protection, education, recreation and tourism, as well as in the wood and non-wood forest products industries. Skills are developed through formal experience as well as through professional certification and licensing requirements, professional societies, continuing education programs, extension landowner outreach programs, and technical and trade training and assistance programs. The indicator recognizes that to maintain institutional capacity in the evolving approaches to sustainable forest management, staff needs access to ongoing developments for the maintenance of their special skills.

Current State and Trend

The Forest Training Institute (FTI) of the Forestry Agency organizes around 70-80 training courses every year to develop human resource in the public sector, including the prefecture governments as well as the Forestry Agency. The major fields of the training include forest planning, forestry mechanization and forest conservation. The coverage is being expanded in recent years, by adding new courses on the wood biomass and low-cost track system.

Figure 90: Change in the number of training courses organized by the Forest Training Center



Sources: Forestry Agency

INDICATOR 7.2.d

Develop and maintain efficient physical infrastructure to facilitate the supply of forest products and services and support forest management

Rationale

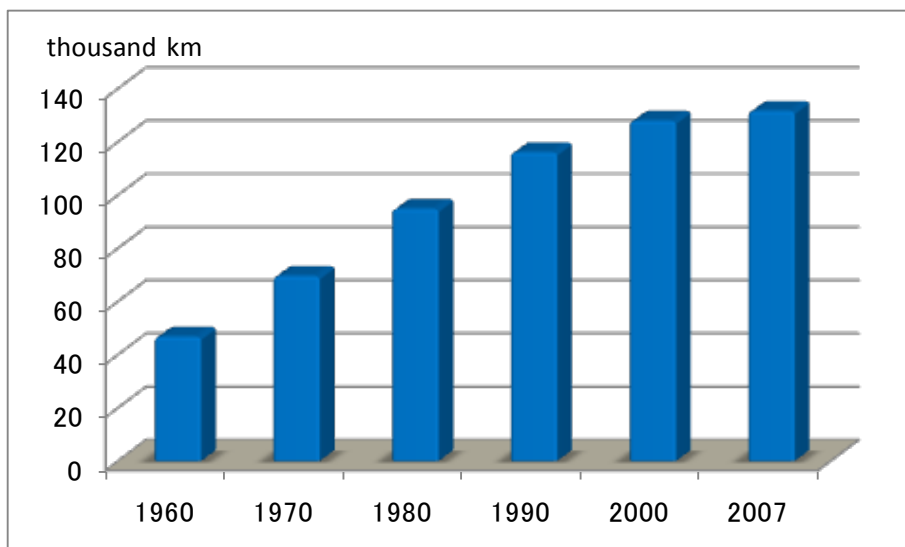
This indicator measures the capacity of institutions to provide the necessary infrastructure that permits access to the forest needed for sustainable management activities (for example, for inventory and assessment, monitoring, research, enforcement, fire management and resource protection, recreation, and efficient harvesting and transportation of products). Appropriate infrastructure is essential to the sustainable supply of forest products and services.

Current State and Trend

The total mileage of forest road, which is an important infrastructures for the forest management, has reached about 130 thousand kilometers currently. Although the total mileage has constantly increased, the annual extension rate is declining in recent years due to the rising cost of construction resulted from the adaption of environmentally friendly construction methods as well as the worsening accessibility of the construction sites.

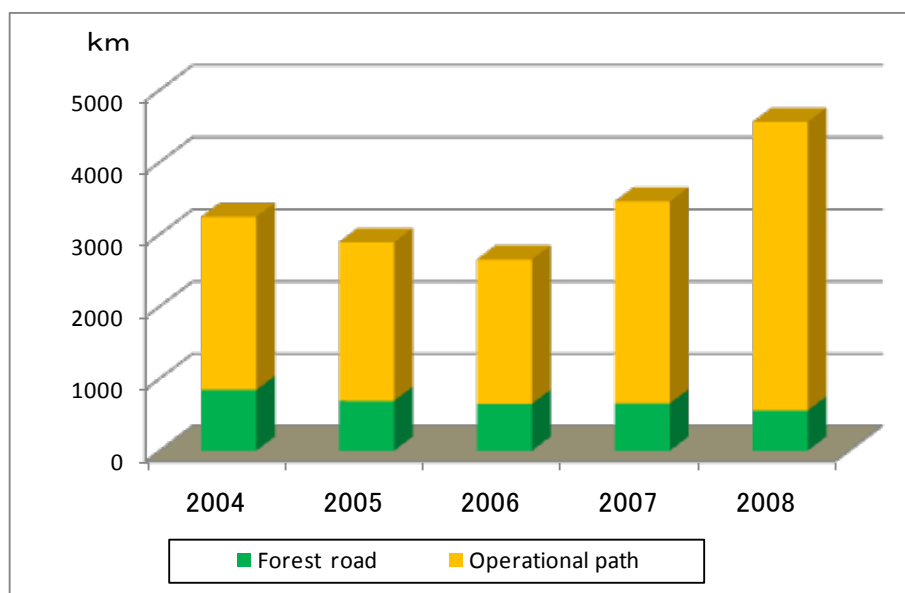
The construction of low-cost operational tracks, on the other hand, which contribute to the efficient use of high-performance forestry machineries, is increasing in its total mileage. In order to ensure the access to forests and efficient forest operations, and to facilitate the improvement and conservation of forests, it is vitally important to develop networks of forest roads and low-cost operational tracks.

Figure 91: Change in total mileage of forest road



Sources: Forestry Agency

Figure 92: Change in mileage of newly constructed forest roads and low-cost operational tracks

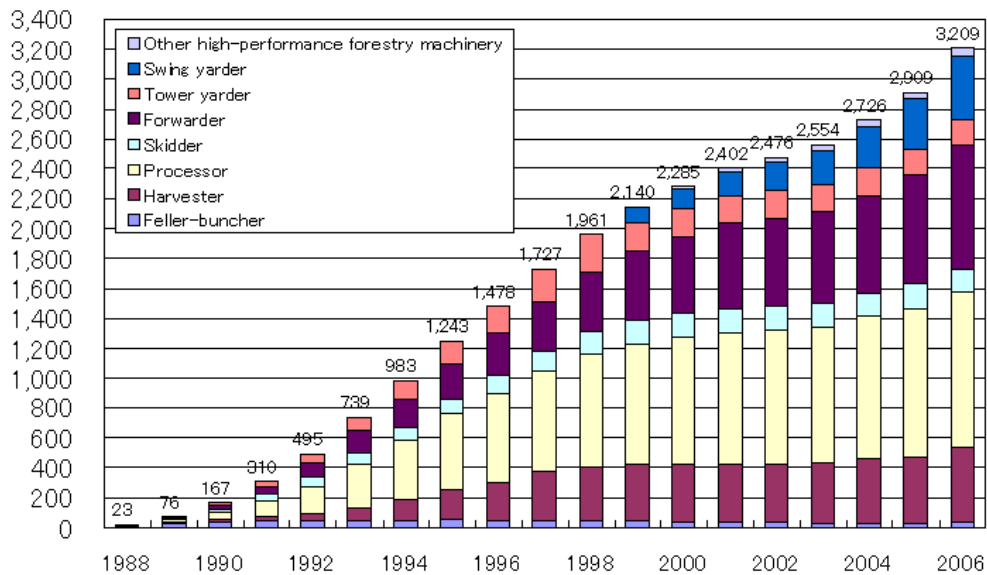


Sources: Forestry Agency

A significant progress has been observed in the last two decades in the use of high-performance forestry machineries in Japan. The number of high-performance forestry machineries existing in 2007 is about 35 thousand, which is seven times as much as the number in fifteen year ago. The major machineries include processors, harvesters and forwarders which together occupies about 70% of the total.

It is highly expected that the operation system comprising road networks and high-performance forestry machineries will contribute to implementation of the low-cost and efficient forest operations and the progress in thinning of planted forests.

Figure 93: Change in the number of existing heavy forest machineries



Sources: Forestry Agency Website

INDICATOR 7.2.e

Enforce laws, regulations and guidelines

Rationale

The effectiveness of laws and regulations that are intended to promote forest conservation and sustainable management will be increased with adequate oversight and enforcement

Current State and Trend

A variety of operational measures have been taken in Japan in order to ensure that the logging and post logging reforestation operations are appropriately implemented by forest owners in accordance with the legislations and regulations concerned.

In preparation for the cases where these forest operations are not properly implemented, in particular, necessary arrangements which enable the concerned mayors to submit recommendations and orders to the forest owners. In addition, operational manuals which interpret legal measures and procedures are prepared for municipal governments, and forest patrolling is reinforced with the assistance of local communities.

7.3 ECONOMIC FRAMEWORK

Forests provide good and services that contribute to a nation's gross domestic product. It is important that government policies which influence the economic behavior of producers and consumers of forest goods and services encourage the maintenance or development rather than degradation or depletion of forests.

INDICATOR 7.3.a

Investment and taxation policies and a regulatory environment which recognize the long-term nature of investments and permit the flow of capital in and out of the forest sector in response to market signals, non-market economic valuations, and public policy decisions in order to meet long-term demands for forest products and services

Rationale

There are many ways in which investment and taxation policies may cause the stock of forest capital to be maintained and/or development in the long term. Taxation policies, for example, are critical to whether forestland is maintained, degraded or converted to other uses. Different types of taxation could provide different incentives to maintain forests as long-term investments.

Taxation policies should recognize forest investment is long-term, and often characterized by irregular income, and should avoid penalizing forest owners for these conditions.

Full and fair accounting for the economic and environmental services from forests for example water quality, carbon stores, recreation, wildlife and biodiversity, is important for the sustainable management of forests.

Current State and trend

With the aim of encouraging sustained and proper management of forests, exceptional arrangements are provided for forest owners in the taxation, as well as the loan and credit schemes, in Japan. In consideration of the long-term nature of forest investment, which normally generates revenue after decades, payment is reduced for some tax items, such as income tax, corporation tax, and inheritance tax, in the case of forest owners.

As a part of the local taxation, forest environment tax is levied in 29 prefectures in 2008 in order to generate necessary funding for a variety of forest-related activities. The total income generated from this tax is around 18 billion Japanese yen, about 80% of which is used in the forest development and improvement.

Figure 94: List of institutional arrangements for forest owners

National government	Prefectural government
◇Exceptional arrangement in forestry-related taxation (Income tax, Corporation tax, Inheritance tax, etc.) ◇Forestry-related finance (Forest management fostering loan fund) ◇Credit guarantee system for forestry	◇Forest environment tax (Inhabitants tax, Corporation tax)

Sources: Forestry Agency

INDICATOR 7.3.b

Non-discriminatory trade policies for forest products

Rationale

Discriminatory trade policies that distort market signals can affect sustainable forest management. On the other hand, trade liberalization can have both positive and negative impacts on sustainable forest management depending on environmental, economic, and social policies that accompany it. Policies should not provide market signals that inadvertently work against sustainable forest management.

Discriminatory trade policies may include quotas, tariff and non-tariff barriers, export subsidies, subsidies on inputs (such as power, transportation, or processing), and domestic price support. Obvious distorting measures are quantitative restrictions such as import and export quotas that block market signals. Another example is “escalating tariffs” where countries impose relatively low import duties on less processed forest products such as logs, but progressively higher duties on more processed products.

Current State and Trend

Japan has adapted non-discriminatory trade policies in accordance with GATT or WTO. The current rate of import duties on forest products is 2.0% in average after the repeated cuts resulted from a series of trade negotiations.

In consideration of the possible negative effects of trade liberalization, which may cause a decline in the incentive to forest management in importing countries, as well as the depletion of forest resource in exporting countries, Japan believes that an international framework to improve the governance of forests ensuring the sustainable use of forest resource is to be established.

Table 8: List of import duties on major forest products

Logs (wood in the rough) except <i>Paulownia</i> spp. (Kiri)	Free	Plywood (other broadleaved)	6.0 %
Wood in chips	Free	Plywood (coniferous)	6.0 %
Sawn wood (Hemlock, Douglas Fir)	Free	Laminated lumber	6.0 %
Sawn wood (<i>Pinus</i> , <i>Abies</i> , and <i>Picea</i> spp.)	4.8 %	Structural laminated lumber	3.9 %
Plywood (tropical wood)	6.0 – 10.0 %	Average of bound rates (2008)	2.0 %

Sources: Forestry Agency

7.4 MEASURE AND MONITOR

The conservation and sustainable management of forests depends on the capacity to measure and monitor, in a continuous, reliable and agreed fashion, forest related biological, social and economic conditions. These can then be reported to management and stakeholders. An open and transparent measuring and monitoring system should support the generation of policies and investment promoting sustainability.

INDICATOR 7.4.a

Availability and extent to up-to-date data, statistics and other information important to measuring and describing indicators associated with criteria 1-7

Rationale

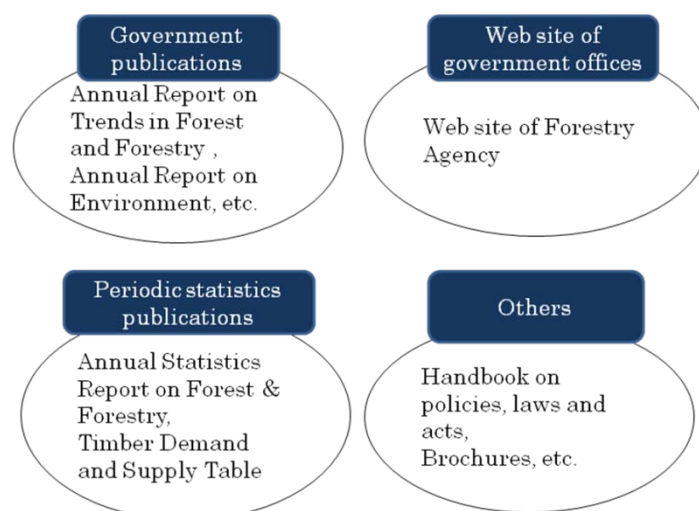
Widespread, accessible, and up-to-date information covering criteria 1-7 is important for timely and effective decision-making.

Current State and Trend

A broad range of forest-related information, such as the forest inventory data and the statistics on forestry, wood industry, forest products, as well as the information on forest-related legislation, institutions, plans, programs and projects, are periodically collected, compiled and publicized mainly by the relevant government offices, including the Forestry Agency and the Ministry of Agriculture, Forestry and Fisheries. The indicators of the Montreal Process are mostly covered by the existing information, as described in this report.

The majority of the collected and compiled information is made available to the public through the formal reports, including the annual reports, a variety of publications, including bulletins, booklets and pamphlets, and web sites, as well as the press releases.

Figure 95: Information sources related to forest and forestry



Sources: Forestry Agency

INDICATOR 7.4.b

Scope, frequency and statistical reliability of forest inventories, assessments, monitoring and other relevant information

Rationale

Released information and decision-making should be based on comprehensive, current and sound data.

Current State and Trend

In formulating district forest management plans, established in every 5 years to each of the 158 river basins, forest inventory data are revised and forest planning maps are adjusted by the prefecture government for the concerning forest planning district divided on a basis of major river basins. Based on the revised forest inventory data, forest management plan is formulated and forest maps are subsequently revised in every five years.

Nationwide data on the area and the growing stock of forests are collected and compiled with the use of the inventory data upon the formulation of management plan.

With the intention of contributing to the progress in sustainable forest management, Forest Resource Monitoring Survey has been carried out since 1999 in order to closely monitor the state of forest located at each of the 16 thousand monitoring spots allocated at every 4 kilometer grid at five year intervals. The compiled data, which contain detailed information of forest ecosystems, including the composition of species, ground vegetation, state of dead trees and barked trees and the composition of soil, are well utilized in this report.

Table 9: Details of major forest surveys

Title	Objective	Frequency	Major properties inspected
Forest survey for establishing forest management plan	To provide basic reference for establishing regional and local level forest plan.	Every five years in each forest planning area	Forested area, geology, soil, forest type, tree species, growing stock, designation by laws, applied type of forest operation
National Forest Inventory	To provide basic reference for establishing Nation-Wide Forest Plan	Every 5 years	As above
Forest Resource Monitoring Survey	To collect data on forest ecosystems including biological diversity that are not grasped by above two surveys and provide basic information to the regional and local level forest plans	Five year rolling base. Ground survey on one fifth of the total plots every year.	Stand structure, stumps, deadwood, floor vegetation, degree of soil erosion

Sources: Forestry Agency

INDICATOR 7.4.c

Compatibility with other countries in measuring, monitoring and reporting on indicators

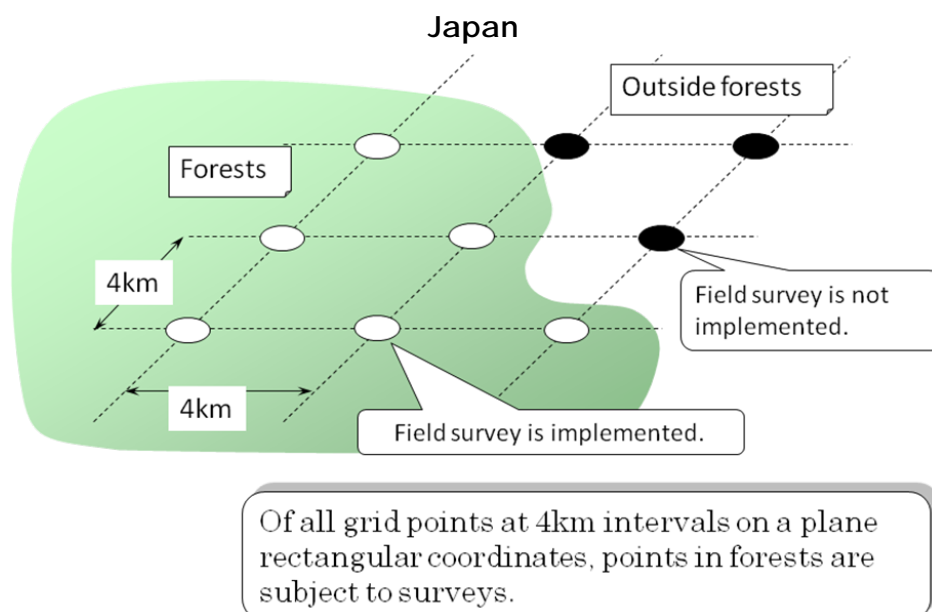
Rationale

Compatible protocols for measuring and reporting can provide for enhanced co-operation and collaboration, thus increasing the efficiency of data gathering. Compatibility also enhances the accuracy and usefulness of global assessments and improves global dialogue. Further, similar data sets allow for adjacent countries to assess their shared ecosystems.

Current State and Trend

The Forest Resource Monitoring Survey, which has been carried out in Japan since 1999, employs a sampling method in collecting the detailed information on forests. Because the sampling method is popularly used in the forest surveys in many of the temperate and boreal forest countries, including member countries of the Montreal Process, it is expected that the introduction of the monitoring survey enables Japan to increase the comparability of the forest-related information with those countries.

Figure 96: Structure of monitoring spot of Forest Resources Monitoring Survey of



Sources: Forestry Agency

7.5 RESEARCH AND DEVELOPMENT

Countries rely upon a base of knowledge to support the conservation and sustainable management of forests. New methods, approaches, concepts, and techniques to enhance this knowledge base should be developed and integrated within decision-making frameworks if full benefits from forests are to be realized. Goals of sustainability can be achieved by enhancing the capacity to conduct research and development.

INDICATOR 7.5.a

Development of scientific understanding of forest ecosystem characteristics and functions

Rationale

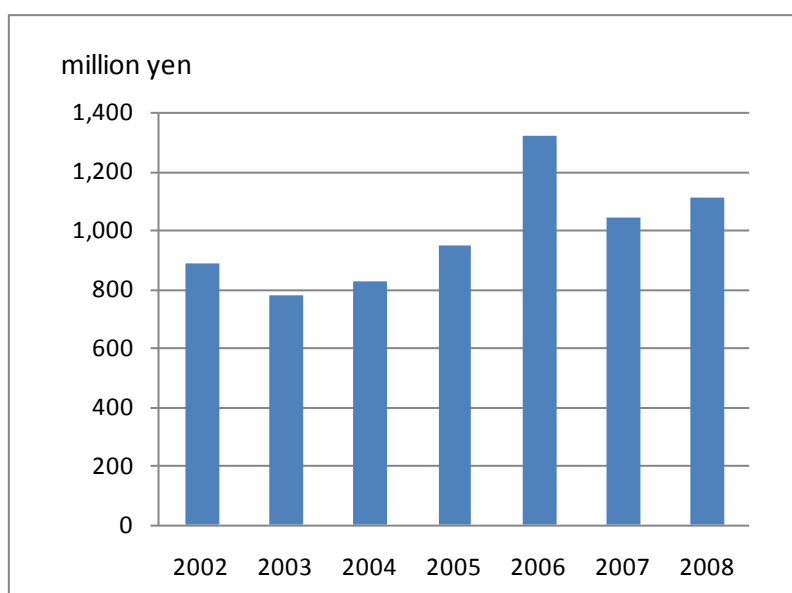
A good understanding of forest ecosystems is essential to the conservation and sustainable management of those ecosystems.

Current State and Trend

The Forestry and Forest Products Research Institute (FFPRI), which is one of the major research organizations in the forest sector in Japan, currently invests more than one billion Japanese yen in the research activities related to forest ecology. The expenditure of the FFPRI is in an upward trend in recent years.

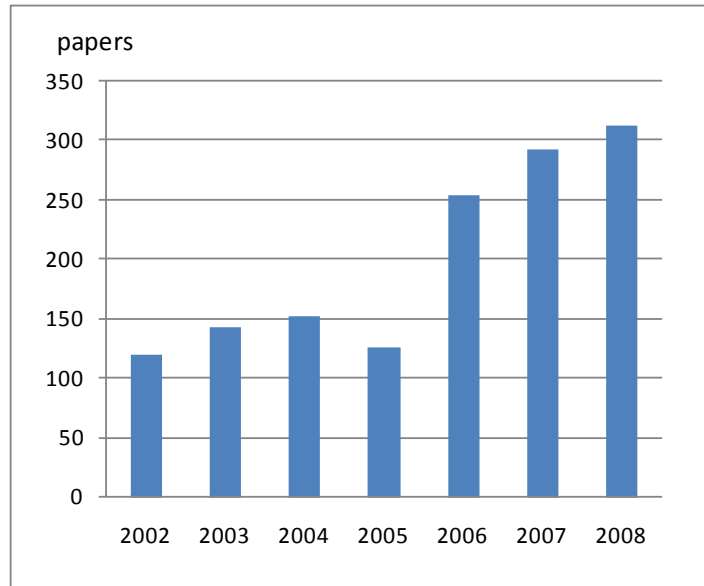
Based on the findings of those research activities, about three hundred papers, which occupies 60-70% of the total number of papers published by the FFPRI, have been written in the last three years. The number of papers are rapidly increasing in this field.

**Figure 97: Change in budget allocation for research activities
related to forest ecology research at FFPRI**



Sources: Forestry and Forest Products Research Institute

Figure 98: Change in the number of papers related to forest ecology at FFPRI



Sources: Forestry and Forest Products Research Institute

INDICATOT 7.5.b

Development of methodologies to measure and integrate environmental and social costs and benefits into market and public policies, and to reflect forest-related resources depletion or replenishment in national accounting systems

Rationale

This indicator describes national emphasis being given to developing methods that integrate forest-related resources and environmental and social values into market and public decision-making. In the past, decision-making have generally been unable to quantify many important social and environmental values of forests. Therefore, decisions were often based primarily on traditional economic measurements of forest market values. The indicator also shows progress in the development of methods that incorporate forest resource, environmental and social data into national accounting systems.

Current State and Trend

Methodologies to measure the environmental and social values include the Contingent Valuation Method (CVM)^{1x} and the Substitution Method², which have been used in the estimation of a variety of non-marketable values, including those of forests and agriculture in Japan.

Although studies have been conducted, no methodology has been developed yet to integrate the estimated environmental and social values of forests into public policies or to reflect them into the national accounting systems.

¹ **Contingent Valuation Method (CVM)** is a method to measure non-marketable values by carrying out a questionnaire to estimate how much money citizens are willing to pay to keep the values.

² **Substitution Method** is a method to measure non-marketable values from the costs of constructing facilities or purchasing articles which generate equivalent values.

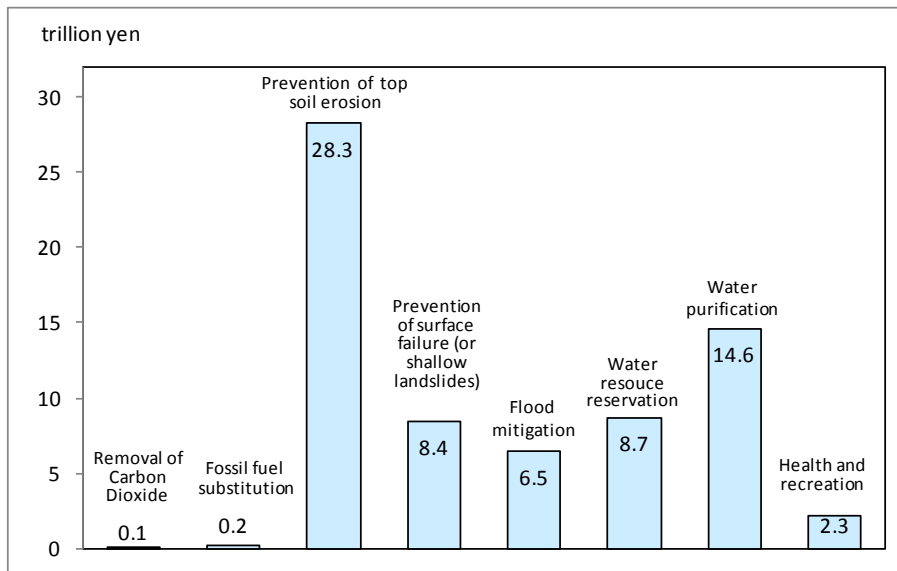
Box6: The Environmental and social benefits from forests

The Science Council of Japan estimated the values of the environmental and conservation benefits generated from forests in 2001 with the use of Substitution Method responding to the consultation by the Minister for Agriculture, Forestry and Fisheries.

According to the estimates, the total of the values amounted to 70 trillion Japanese yen only for those estimated.

It clearly demonstrates that we are enjoying enormous benefits from forests.

Figure 99: Value estimation of forest functions



Sources: Science Council of Japan. Report to the Minister of Agriculture, Forestry and Fisheries

INDICATOR 7.5.c

New technologies and the capacity to assess the socio-economic consequences associated with the introduction of new technologies

Rationale

The forest sector should be broadly defined to include not only the wood and non-wood forest products industries, but also forest research, management, protection, education, recreation, and tourism. New technologies can have positive or negative effects on the forest sector. It is important to assess these potential effects, in order to determine whether to promote or discourage new technologies.

Current State and Trend

In order to avoid the negative impact of the new methods or technologies, such as the soil erosion by the construction of low-cost operational tracks and the soil compaction by the use of high-performance forestry machineries, technical studies or assessment by expert groups, if necessary, are conducted in prior to their introduction. Through these measures, improvement of the method or selection of alternative technologies is further considered.

Wood is an environmentally friendly material which consumes less energy and emissions less CO₂ in the manufacturing process compared with other materials. With the intention of making such advantage of wood be conveyed to consumers, development of methodologies to “visualize” the CO₂ emissions in the manufacturing process is now being conducted.

INDICATOR 7.5.d

Enhancement of ability to predict impacts of human intervention on forests

Rationale

Effective public decision-making on sustainable forest management requires the accurate prediction of impacts of forest-based activities. This indicator aims to demonstrate the current capacity of research to predict the impact of human intervention on forests.

Current State and Trend

With the aim of contributing to the protection of endangered bird species, such as Blakiston's Fish Owl (*Keputa blakiston*), Black Woodpecker (*Dryocopus martius*) and some raptorial birds, the Regional Forest Offices have developed guidelines to be applied to the forest operations in their respective national forests. Based on the guidelines, some forest operations, such as logging, are suspended. Research findings on the ecology of those species have been fully reflected to the respective guidelines through the consultations to the researchers concerned.

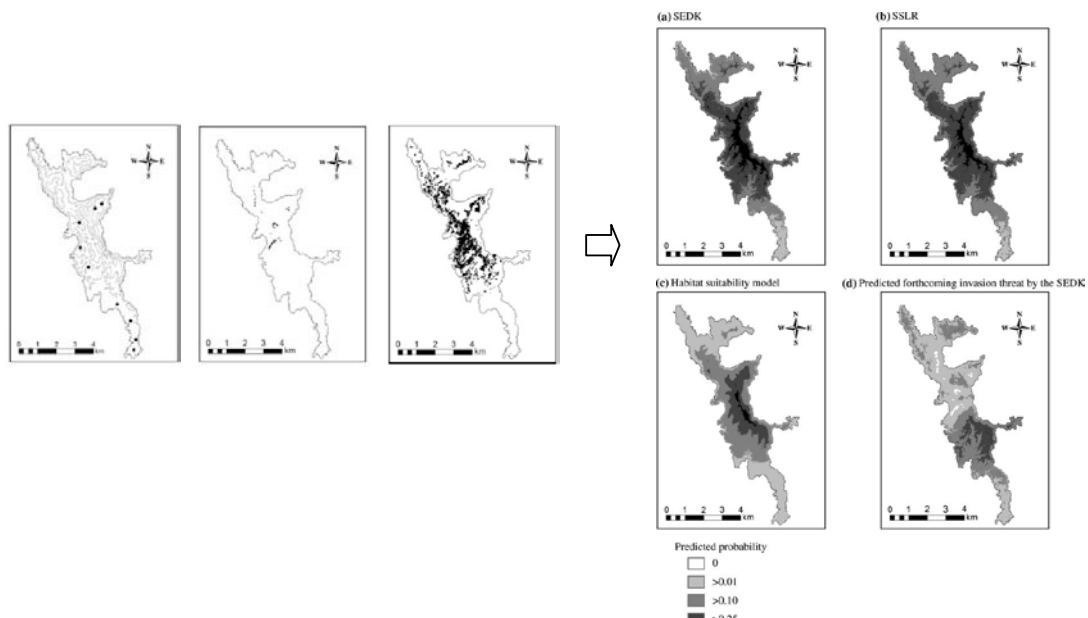
Box7: The spread of exotic species

On the Ogasawara Islands, which is one of a few oceanic islands in Japan, unique ecosystems with a high rate of endemic species are maintained. Such highly valuable nature on the islands have been eroded by the spread of exotic species.

Akagi (*Bischofia javanica*) is one of such exotic species, which has rapidly expanded its distribution area since its introduction in 1930 displacing the indigenous species mainly in gaps in forests, including those with high conservation values.

With the aim of assisting the consideration of effective countermeasures, a study to identify the potential distribution areas has been carried out by the Forestry and Forest Products Research Institute (FFPRI). Eradication project has also been conducted by the Forestry Agency since 2002. As a result of these efforts, Akagi was completely eradicated on some islands and yang trees of indigenous species have significantly increased also on other islands.

Figure 100: Expansion of distribution of Akagi (*Bischofia javanica*) on the Ogasawara Islands



INDICATOR 7.5.e

Ability to predict impacts on forests of possible climate change

Rationale

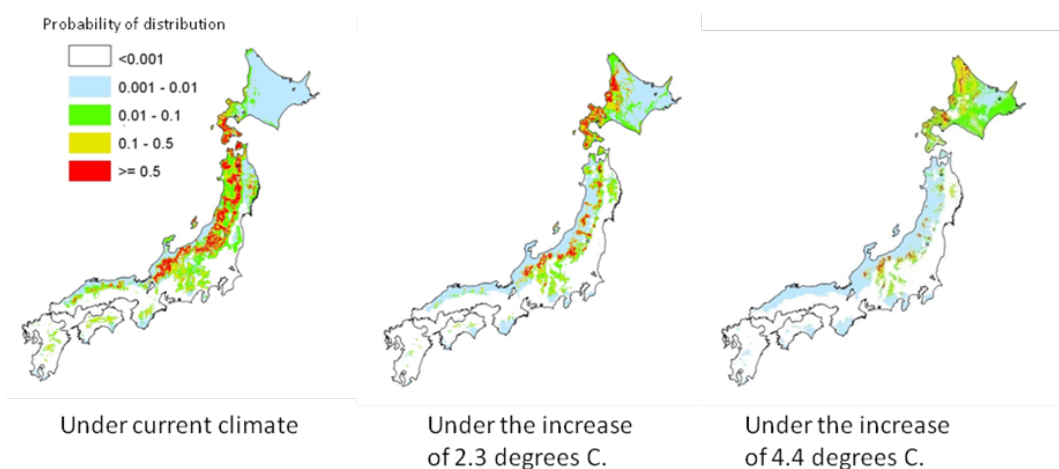
This indicator measures the ability to predict potentially significant impact on forests from climate change. An improved ability to predict such impacts should enable early mitigating actions, thus improving the likelihood for sustainable management.

Current State and Trend

Research organizations in Japan, including the Forestry and Forest Product Research Institute (FFPRI), are currently engaged in a variety of studies to predict the possible impact of climate change on forests. The research findings indicate that the potential distribution range of beech forests and sub-alpine forests, may be marginalized due to the rising temperature and changing precipitation and the damages by the pine beetle syndrome may expand to the northern end of Honsyu Island due to increasing damage risks.

In the case of beech forest, which is one of the major deciduous broadleaved forests in Japan, it is predicted that the suitable growing area may shrink to the 56% and the 21% of the current level respectively if the average temperature rises by 2.3°C and 4.4°C respectively.

Figure 101: Prediction of the suitable habitats for beech (*Fagus crenata*) forests under climate warming



Sources: Matsui et al. (2009)

POSTSCRIPT

Improvement in the Information Collection

In this second country report of Japan, information is provided for 62 indicators which account for 97% of the 64 indicators subject to report. The percentage of the reported indicators has increased compared with the 91% reported in the first country report published in 2003. The newly covered indicators include Indicator 1.2.c (Efforts focused on conservation of species diversity), Indicator 1.3.c (Efforts focused on conservation of genetic diversity) and Indicator 6.1.c (Revenue from forest-based environmental services).

Improvement was observed also in the quality of the provided information as well. For example, more detailed or inclusive information is provided for Indicator 6.3.c (Resilience of forest-dependent communities) and Indicator 7.2.d (Physical infrastructure for forest management). More relevant information is identified and provided for some indicators, such as Indicator 1.1.c (Fragmentation of forests) and Indicator 6.2.a (Capital investment in forest management, etc.), with respect to the aims of these indicators respectively.

Such improvement is largely attributed to the implementation of Forest Resource Monitoring Survey, in which key components of forest ecosystems, such as the state of all plant species, including tree species, and the condition of soil, are closely monitored. Combination of the plot data newly collected at the 16 thousand fixed monitoring spots with the blanket data compiled in the traditional forest inventory system provides us with extremely useful information on forests on the national scale, as demonstrated by the results for Indicator 1.1.a (Forest ecosystem types) and Indicator 4.2.b (Soil degradation). For the better understanding and assessment of forests, further improvement in the accuracy of measurements, as well as the better use of data obtained through the Monitoring Survey, is highly valuable.

Challenges by the Montreal Process

Areas for future challenges by the Montreal Process have been also recognized through the works to produce this second country report, as well as the discussions in the Montreal process. The revision of indicators in the past three years, which considerably improved their operability, has made it rather clear what breakthrough is to be made for the further progress of the Montreal Process.

One of such areas is a possible expansion of the scope of indicators under Criterion 3, which currently cover only biotic and abiotic damages on forests. Because the multiple benefits of forest are generated through the functions of forest ecosystems, the sustainability of forest management is primarily conditioned on the healthy and vital forest ecosystems. In spite of all difficulties, therefore, efforts should be continued for finding an appropriate way to capture the health and vitality of forest ecosystems. It should be noted, in this connection, that the Working Group of the Montreal Process decided to assign a task to the Technical Advisory Committee (TAC) to “recommend how Montreal process indicators can assist in identifying and monitoring forest degradation trends” in its 20th meeting held in the Republic of Korea in 2009. This new challenge is expected to contribute not only to the further progress of the Montreal Process itself but also to the global efforts toward the reducing emissions from deforestation and forest degradation in developing countries (REDD) under the United Nations Convention on Climate Change (UNFCCC).

Another area for future challenges is related to the traditional issue of how the measurements of indicators are to be assessed collectively in the context of the sustainability of forest management. With the recognized supportive and trade-off relations existing among indicators, it is presumably possible to develop some useful methodology to effectively analyze and present the results of the application of indicators. In this respect, it is fully welcomed that the Technical Advisory Committee (TAC) will soon set out on its work to “develop a synthesis of member countries’ work undertaken to improve communicating indicator data” based on the decision made by the Working Group at its 20th meeting.

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