ISSN 0919-8822
November 2011
No.62

JIRCAS Newsletter for INTERNATIONAL COLLABORATION

In This Issue

JIRCAS
JAPAN INTERNATIONAL RESEARCH CENTER FOR AGRICULTURAL SCIENCES

Sustainable Forests: Man's Legacy for the Future

If you travel in Northeast Thailand, it's common to find trees standing in the middle of a rainfed paddy or inside a crop farm. Some trees show curiously slender silhouettes having been pruned up to their upper canopies. Other trees have expansive wide crowns and offer cool shade to farmers and cattle who are taking a rest. Certainly, some trees are regularly cut for their use as timber. In such cases, large branches from felled trees are gathered in a corner of the paddy field and processed into charcoal with a simple handmade kiln buried in the soil.

Although local residents still depend for some parts of their livelihood on forest products such as mushrooms, bamboo shoots, young tree shoots, some insects, animals and wild plants for food, as well as timber for construction, furniture, wood fuel, charcoal and resin, the forest still remained even though the people have exploited it themselves. To them, charcoal is still the best fuel to grill fishes and chicken, and gas is just a second-best fuel in spite of its convenience. They are clearing the forest around the village to become open land, and yet they can't imagine life without the forest.

Trees possess unique characteristics if compared with farm crops consisting mainly of annual and perennial plants. They usually have large sizes, longer longevity and require more time to reach maturity. When it takes a long time for saplings to mature into wide and tall trees with deep expanding roots, differences of the microclimate between the inside and outside, from the bottom to the top of the forest become discernible. Forests thus offer many functions, not only in producing wood and nursing the water resource but also in creating suitable habitats with their deeply foliaged canopies for many plants and animals, including insects. They also foster fishery resources in case of swamps and consequently support the livelihood of local residents. They bestow a lot of benefits such as natural resources and a biodiverse environment for local residents, who usually reciprocate by exerting efforts to continue using them as a sustainable resource. In other words, even if a forest could be restored, it would have no value to the villagers and may easily be destroyed again unless incentives are offered to support the villagers' livelihood which will give them reason to preserve it.

Besides, in recognition of the serious impact of climate change on human security which has become a huge issue recently, the role of forests to ease greenhouse gas emission and the conservation of forests which store huge amounts of organic carbon had been highlighted as one of the most feasible countermeasures to ease the global environmental issue. Effective conservation will solely be realized through the wise and sustainable use of forest resources based on actual demand for forest products by the local residents.

The United Nations has declared the year 2011 as the International Year of Forests. And the international community has recognized the importance and the present critical situation of the forests, particularly within the last quarter century. It has been perceived that native Americans are fully cognizant that their forests are not gifts from the ancestors but borrowed from their offsprings, and therefore have tried to keep the forests sustainable for their descendants.

We have to urge the establishment and development of various countermeasures to protect the forests in accordance with the ecological and social realities of each region

In this issue of the JIRCAS Newsletter, topics were selected to focus on rational techniques which were developed in order to fully utilize the benefits from forests and surrounding ecosystem while sustaining and conserving them in the process. These are the recent international schemes to suppress GHG emission by conserving the forests and the challenges and direction to take: the medicinal uses of mushrooms by local residents as one of the application of native wisdom, high performance-use of plantation products to suppress deforestation, tree genetic research to facilitate the healthy regeneration of tropical forests, and development of techniques to support emerging farmer-owned teak plantation forestry in northeast Thailand.

What is the significance of preserving viable forests as legacy for our descendants? Let us contemplate on this thought together.

Ryuichi Tabuchi
Director, Forestry Division
JIRCAS

Research and Development for the Emerging Teak Forestry in Thailand

Teak, useful economic tree species of Thailand

Teak (*Tectona grandis* L.f.) is one of the useful indigenous tree species of Thailand, and is used for fine quality furniture, building materials, etc. Therefore, it is dealt with at a higher price (Fig. 1). It has outstanding characteristics in terms of silviculture, such as fast initial growth and strong resistance to damages by disease, pests and forest fires. Its natural distribution is limited to India, Myanmar, Thailand and Laos. However, the decrease of natural stands brings heightened attention to more teak plantation development. In the world, teak plantations have been developed in 36 or more nations including native countries as Thailand, and form 75% of the fine quality tropical tree species plantation areas as of 2000.

Fig. 1. The biggest teak in the world (Sak Yai Forest Park,Uttaradit Province) (Photo by I. Noda)

Teak plantations began in private lands

In Thailand, forest areas decreased drastically due to conversion into agricultural lands amidst the remarkable economic development. The forests which formed 53% of the country's total areas (27,360,000 ha) in 1961 decreased to 26% in 1993, and most especially sharply decreased from 42% to 13% in northeast Thailand. On the critical background of the forest situation, the Thai government recognized it as a serious issue in land conservation, and has targeted 40% of forest coverage rate in its National Forest Policy of 1985 to carry out measures for the stabilization of timber production. The Royal Forest Department (RFD) started the subsidiary reforestation projects in 1994 in order to promote the reforestation of indigenous economic tree species in private lands.

Afterwards, teak plantations were widely established with the intent of forestry. Farmers as planters set teak plantations in the agricultural lands normally used for agricultural crop cultivation of cassava, sugarcane, etc. since they do not hold mountainous lands aside from agricultural lands. It is striking that Thai farmers' teak plantations differ greatly from Japanese plantations, which don't compete with agricultural products in mountainous land. The teak plantation area by 2001 accounts for 150,000 ha among the whole reforested areas of 350,000 ha.

Forestry is a regular vocation; that is, people plant and grow forest trees to harvest and sell them, and plant there again for livelihood. Japanese forestry has more than 100 years of history, and had accumulated various technical research outputs on main tree species, Japanese cedar, cypress, etc., as compared with the history of teak forestry by farmers in Thailand.

Present conditions of teak forestry by farmers

Teak plantation operations generally show high economic efficiency and profitability under suitable management, since teak timber price is high. However, there have been increasing cases of the conversion of teak plantations to other crops, such as rubber, eucalyptus or cassava before they could obtain sufficient yield from teak. JIRCAS has carried out a joint research project with the Royal Forestry Department (RFD) in order to back up farm forestry management involving teak, and contribute to the improvement of the local livelihood since 2006. We took up northeast Thailand as our study area, which is in the lower livelihood level with its critical forest situation.

Based on the results of field surveys, farmers generally receive instructions about silvicultural management from

RFD officials or agricultural extension officials, but in many cases, agricultural knowledge had been diverted, and the knowledge required for silvicultural management had not been used effectively. Deficient knowledge about suitable sites for teak planting sometimes causes the trees' poor growth. Likewise, the trees could become less healthy and low in quality if there is no application of density control by improvement cutting or thinning in their growing stages. As a result, a farmer may lose the benefits or incentives of teak management, and cancels the management midway to convert the land to other crops, without having gained a big income. The cancellation may also be attributable to lack of land use and financial planning required for a longer period of timber production.

Fig. 2. Interview with a farmer (Nong Bua Lum Phu Province) (Photo by N. Jedsorn)

Fig. 3. Farmers' 15 year-old teak plantations (Nong Bua Lum Phu Province): a case of mismanaged plantation on unsuitable site (left), a case of appropriately managed plantation on suitable site (right). (Photo by I. Noda)

Research and development to support promotion of teak forestry

There is an expression called "right tree for right site" in Japanese forestry. It means that careful examination of each suitable site is required before the establishment of a plantation, because tree growth takes a long period of time on the occupied land. Teak growth is strongly influenced by soil conditions. Therefore, this rule becomes important for teak plantations, too. In Thailand, the Soil Group Charts were made as a database for agricultural lands nationwide based on various factors, such as subsoil properties, drainage and soil depth, etc. We conducted field surveys and analysis of the relationship between the soil group and teak growth, and developed the 'Suitable Teak Planting Site Charts on Nong Bua Lum Phu Province and Udon Thani Province in northeast Thailand. The charts have a medium scale of 1/50,000 resolution, and can also be available for interpretation of suitable sites in charge of forestry extension, but limited to wide area planning because of the resolution. Therefore, we are continuing technical research to enable quantitative evaluation of the degree of teak planting suitability and the teak growth grade (site quality) of each farmland in advance.

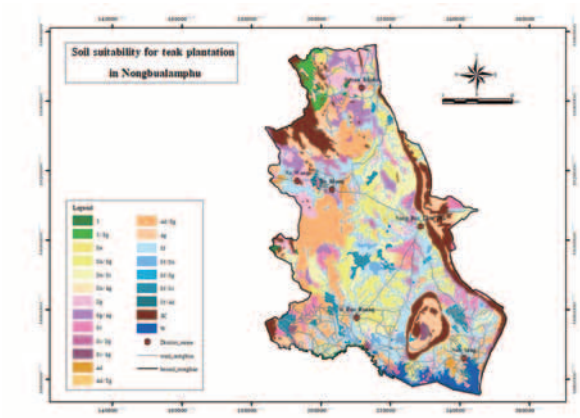

Fig. 4. Chart of suitable sites for teak planting in Nong Bua Lum Phu Province

Proper harvest planning is also necessary for efficient plantation management. The stand yield table is an important

tool to estimate indices such as average individual tree size (diameter, tree height) and stand volume by age, site quality and region. There was no table for northeast Thailand, and through field surveys with innovated method, we created a yield table for teak plantations in northeast Thailand (Fig. 5.) (It is available on the web via this URL of the RFD website: http://forprod.forest.go.th/forprod/ebook/default.html).

Now, a farmer can evaluate future yield and sale proceeds using the yield table. However, we could not involve the thinning effects in our yield table, because there were only a few thinned stands so far. Therefore, we are going to advance research on the setting up of some experimental thinning plots.

Fig. 5. Yield table for teak plantation in northeast Thailand published as a handbook (left), handed out to a farmer (right) (Photo by N. Furuya)

It has also become important to examine profitability and labor inputs in order to carry out a stable management. Even if a farmer can sell crops at a high price, we can't assume that the management is stable suchas in the case of high production costs. On the other hand, teak plantation management doesn't need much labor input as a whole, but the required labor input varies by agricultural crops. A farmer has to combine different kinds of production crops including the teak plantation in consideration of sufficient labor input. Our research clarified that a composite management of agriculture and teak plantation could largely mitigate the obstacle of insufficient income until harvest is obtained under the teak operation, with the land use strategy. Hereafter, we will improve the profitability analysis system created for the research in order for it to be utilized as a decision-making tool at the extension spots in northeast Thailand.

In Thailand, 36 forestry cooperatives have been established all over the country under instructions by RFD in 1996 and afterwards. The purpose is aimed at mutual cooperation among planters, the same as the forestry cooperatives in Japan. We also tackled research on the present conditions and problems, and proposed measures including strengthening of the brokerage functionality in timber marketing.

The above is an outline of our technical research to support farmers' teak plantation management. Forestry promotion is a major theme. However, we will enrich the research described previously, and develop more efficient and effective technologies with new perspectives in order to contribute to the stabilization of useful indigenous treespecies forestry, and the improvement of farmers' livelihood.

Iwao Noda
Forestry Division, JIRCAS

Utilization of Tropical Lignocellulosic Biomass

Recently, "biomass resources" are in the spotlight. In the first place, the word "biomass" refers to materials obtained from living organisms (mostly of plant origin) with certain mass and one of its important features is that it can be reproduced by photosynthesis etc. Because of this feature, instead of using fossil resources (e.g. petroleum, coal and natural gas), which cannot be reproduced and available only in finite amounts, the trend of expanding the utilization of biomass resources is increasing.

Currently in JIRCAS, we are conducting researches on utilization methods for oil palm biomass. Oil palm has been grown in plantations on a large scale in Southeast Asia (Malaysia, Indonesia, etc.) and it has been a major issue that forests were cut down during the development of these plantations. However, if we can develop new utilization methods for biomass resources from plantations that already exist and substitute them for the resources from natural forests etc., these will probably contribute to environmental protection.

An oil palm tree is shown in Fig. 1. The original products of the plantations are "palm oil and palm kernel oil", which are derived from fruits at the top. Upon harvesting, biomass resources such as empty fruit bunches or kernel shells are produced as waste by-products. In addition to these, fronds at the plantation site are not all used effectively. To maintain high productivity of the fruits, oil palm trees are felled and replanted every 25 to 30 years during which a massive quantity of felled trunks are generated as waste biomass.

Fig. 1. Oil palm tree

One of the biomass resources we are focusing on is the trunk, namely the oil palm trunk. Although the height is quite lofty and some people might think that it looks like a "tree", the majority of plants in the monocotyledon group to which oil palm belongs are herbaceous plants. When an oil palm trunk was sliced horizontally, the inside looked spongy (Fig. 2). Likewise, from the point of view of chemical components, it is different from a common tree. In the case of major Japanese woods, the total amount of three components, namely cellulose (Notes 1), hemicellulose (Notes 2) and lignin (Notes 3), contribute up to 95% of their chemical components. In the case of the oil palm trunk, it is known that in addition to those three, there are also starch and monomeric and dimeric sugars in quantities that cannot be ignored.

Fig. 2. Cross-section of oil palm trunk after drying
(Note: While standing, it may look like a "tree". However, the vascular bundles that appear in the cross-section are scattered and there are no cambium and no secondary growth.)

One of the utilization methods we have contemplated for such waste oil palm trunk is to use it as a board material. At JIRCAS, we have been collaborating with Universiti Sains Malaysia and The University of Tokyo on the research

of producing a “binderless board (Fig. 3)”, a board which is produced from powdered oil palm trunk by direct pressing under heat and pressure, without the addition of binders. We are aiming to produce it by using only renewable resources, without using synthetic adhesives derived from fossil resources. In addition, the board won’t release harmful chemicals during use, so we can say it is a safe and friendly material not only for the environment but also for humans. However, the board we have produced so far does not show high resistance to water, so tentatively we are thinking of its usage for indoor purposes, such as furniture for example.

Fig. 3. Binderless particle board produced from oil palm trunk

Aside from the above, JIRCAS has been conducting researches on bioethanol production from the oil palm trunk by utilizing its contents of monomeric and dimeric sugars, and on wood composites production using fibers obtained from empty fruit bunches. It is very difficult to accomplish results, like a silver bullet or panacea, which can drastically change the world. However, diversity of uses for some raw materials or of end-products from the same raw material will become an important perspective in the future when resources will be scarcer.

Notes:

(1.) A linear polysaccharide of β (1→4) linked D-glucose.

(2.) Constitutional polysaccharides of embryophytes cell wall, other than aforementioned cellulose and pectin type polysaccharides. Generally, it is amorphous.

(3.) A polymeric compound, its basic structure is randomly linked phenylpropane units which have an aromatic ring.

Tomoko Sugimoto

Forestry Division, JIRCAS

Sustainable Forest Management of Tropical Forests

It is estimated that about 20% of tropical forests in Southeast Asia has gradually disappeared within the past 15 years ending in the year 2005 due to commercial forestry activities, even though the tropical rainforests are the richest sources of biodiversity available. Tree species belonging to Dipterocarpaceae predominantly occupy most of the tropical rainforests in Southeast Asia. 'Lauan' is the appellative or generic name of timber or plywood from dipterocarps.

Two mating systems apply to the reproduction of dipterocarps. One is 'outcrossing', mating with different individuals by insect-mediated pollen dispersal. The other is 'selfing', or self-pollination. However, deleterious genes are usually expressed in the selfed seeds, which decrease the fitness of selfed seedlings. The selective logging system has applied standards in Malaysia in which loggers can harvest trees of more than 45 cm 'diameter at breast height' (dbh) trees for non-dipterocarps and more than 50 cm dbh for dipterocarps in the system. After the harvest, outcrossing by insect-mediated pollen dispersal and subsequent healthy forest regeneration are expected to occur. Therefore, we identified the pollen dispersal distance and effective pollen production of each tree dbh size using genetic paternity analysis to verify effective regeneration of the present selective logging system. We have also developed a simulation model to propose optimal selective logging criterion to induce healthy forest regeneration.

Genetic paternity analysis of seeds was applied to identify pollen dispersal distance. We conducted research in a virgin jungle research plot, about 500 m a.s.l. of the Semangkok forest reserve which is located at 60 km north of Kuala Lumpur, Malaysia (Photo 1). General flowering in aseasonal Southeast Asian tropical forests is widely recognized, which is characterized as synchronized flowering between tree species belonging to different taxa. We observed mass general flowering in 1998 and 2005, and sporadic general flowering in 2002. Seeds were collected at these general flowering seasons and pollen dispersal distances were estimated.

Photo. 1. A view of the forest canopy in the Semangkok Forest reserve. Seraya tree canopy appears whitish.

Almost the same average pollen dispersal distances were estimated in 1998 and 2005, which were 65 m and 67 m, respectively. However, the sporadic general flowering season in 2002 showed the average pollen dispersal distance as much farther apart (82 m, Fig. 1). Significant result of less pollen production in small size trees (less than 50 cm dbh) was observed. The data indicated that mating by outcrossing would not be facilitated if we conserve only the smaller trees after selective logging. Therefore, we have developed a simulation model to propose an effective selective logging strategy.

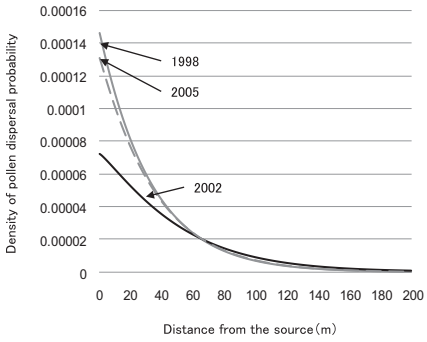

Fig. 1. Pollen dispersal kernel estimated from the model.

Fig. 2 showed the results of the simulation. Although results fluctuated year by year, the amount of pollen reaching mother trees was reduced by around 5% to 15% after the harvesting of more trees with 50 cm dbh. The reduced rate of pollen production didn't rapidly recover even if we increased the selective logging criterion up to 70 cm dbh. We have to increase the selective logging criterion for tree diameter up to 80 to 85 cm dbh to ensure half of the pollen amount observed before selective logging. For example, the conservation of middle-size trees (70 to 90 cm in dbh) which produce large amounts of pollen is effective for reversing the reduced rate of pollen production with quantity increased up to 35% to 60% compared to pre-harvesting level. Hence, it is essential that we revise the selective logging criterion more strictly.

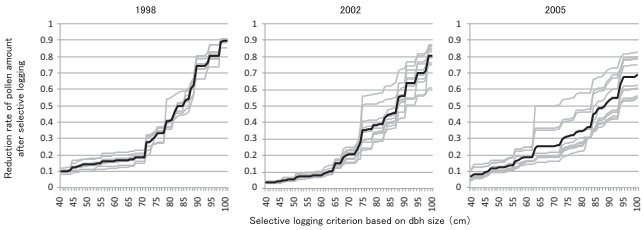

Fig. 2. Reduction rate of outcrossing pollen amount after the selective logging simulation
(The selective criterion was dbh at increments of 1 cm.)

Naoki Tani
Forestry Division, JIRCAS

Tropical Forests and People's Livelihood: Stalls of Traditional Medicine Vendors in Kota Kinabalu

I used to work with a Malaysian research institute and stayed for a couple of years in Sandakan, Sabah State, Malaysia (Fig. 1). While visiting the state capital Kota Kinabalu on weekends, I learned that a Sunday market was held regularly on Gaya Street at the heart of the capital and my curiosity brought me there. I found a stall displaying large woody mushrooms (bracket fungi) as the vendor's symbolic sian, setting it apart from several vendors in the street. It was a traditional medicine vendor's stall (Photo. 1).

Fig. 1. Map of Borneo Island (left) and of Sabah State (right)

Photo. 1. A street stall of traditional local medicines in Kota Kinabalu. A big Ganoderma mushroom which serves as a shop sign is behind the right umbrella.

A lot of medicinal materials were arranged on the table: tree seeds (fruits/nuts), woody roots (tree roots), tree barks, resin, mushrooms, acorns (pine cones), grasses, ant plants, dried sea dragons, seaweeds (grasses) and sulfur (Photo. 2). So many materials from both land and sea which were hard to identify and list down were used as local medicines. Reliance on those traditional medicines is still high and stable even now in this period when advanced medical care is already available. I met a Kuala Lumpur citizen who dropped in on this Sunday market when he visited Kota Kinabalu for business, came to this shop and bought several, "I've been looking for this medicine so long and I finally found it here. We can no longer buy it in KL." His face looked so happy.

Yes, my attention was caught and my curiosity had often brought me to this stall several times after that. One day, I discovered a curious mushroom on display for sale as medicine. It was a slender and tall mushroom with a stalk of nearly 20 cm in length. The surface of the cap was velvety and yellowish brown and showed a pattern of concentric circles and very thin leather-like texture with no cone. The bottom of the cap had fine pores with cream color and the stalk or stape stuck out from a clumpy mycellium seemingly like stone grown on the earth.

Photo. 2. Traditional local medicines utilizing many kinds of natural materials

The scientific name of this mushroom is *Lignosus rhinocerus* (Cooke) Ryvarden, and called as Kulat susu rimau or Cendawan susu rimau (harimau) in Malay language. It means "Tiger's Milk" mushroom. This species is found in the Philippines, South China, Malay Peninsula, Borneo, New Guinea, Australia and Okinawa in Japan as well. It is known as Hijiri-take in Okinawa. Hijiri-take has been traditionally used as medicine in Malaysia, and it has been reported to work effectively in suppressing fever, cough, asthma, breast cancer and food poisoning (Photo.3).

Photo. 3. One of the medicinal mushrooms in Borneo, *Lignasus rhinocerus*, which has a brownish-yellow color cap and an elongated stipe (center)

Reishi (*Ganoderma lucidum*) and Sarunokoshikake (Polypore in English) mushrooms became popular among medicinal mushrooms. However, Hijiri-take is a very rare mushroom with very limited distribution found in small spots and grown from clumpy mycelium (sclerotium) in the ground. All these characteristics make it possible to find Hijiri-take in the forest despite its rarity so that it has become one of the most important medicinal mushrooms in Malaysia. With its ecology being less studied and its artificial cultivation proven difficult so far, Hijiri-take is listed in "The Threatened Wildlife of Japan" or Red Data Book published by both the Ministry of Environment and Okinawa Prefecture as Level 1 endangered species (Threatened I CR+EN) and is being protected.

It is well known that tropical forests in Southeast Asia are rapidly decreasing due to recent exploitation. Degradation of the forest environment brought by deforestation threatens not only the timber resources but also the survival of rare wildlife and plant species. Thus, researches on the propagation techniques of endangered plant species should therefore be strongly encouraged. At the same time, we have to recognize that we lose more than the forest when a forest disappears. The local wisdom of our ancestors, who lived and co-existed in harmony with the forests, particularly on the medical uses of wild plants, must be found and recorded as invaluable source of knowledge and culture.

Akihiko Yokota

Forestry Division, JIRCAS

Reducing Emission from Deforestation and Forest Degradation (REDD-Plus)

Introduction

Reducing emission from deforestation and forest degradation in developing countries (REDD) has been negotiated under the United Nations Framework Convention on Climate Change (UNFCCC) as an important option for mitigating climate change. REDD is based on a simple idea of rewarding individuals, communities, firms, projects and countries that reduce forest-related greenhouse gas (GHG) emissions (Fig. 1) from deforestation and forest degradation. In REDD-Plus, such reward can be obtained by increasing the removals through the enhancement of forest carbon stocks, forest conservation and sustainable management of forest (Table 1).

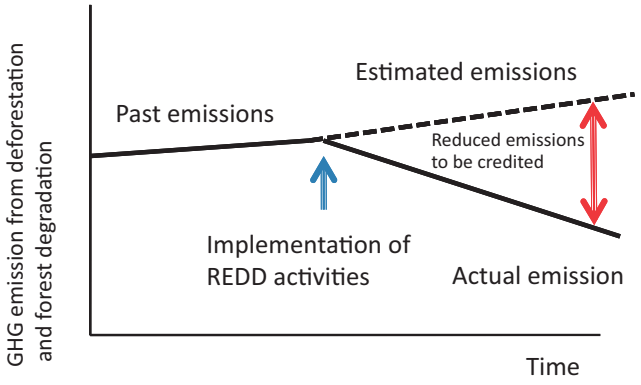

Fig. 1. The core idea of REDD is reward for the reduction of greenhouse gas emission from forests.

Table 1. Creditable activities in the REDD-Plus mechanism

Changes in:	Reduced negative change (REDD)	Enhanced positive change (REDD "Plus")
Forests area Number of hectare	Avoided deforestation	Afforestation and reforestation (A/R)
Carbon density (Carbon per hectare)	Avoided degradation	Forest regeneration and rehabilitation (Carbon stock enhancement)

Reference: Wertz-Kanounnikoff and Angelsen, 2009

Greenhouse gases, the major causes of global warming, are emitted through the combustion of oil, coal and other fossil fuels, as well as the results of deforestation and forest degradation in developing countries which account for about 20% of the global greenhouse emissions. No new technology is needed for reducing deforestation and forest degradation. The opportunity cost for economic activities that lead to deforestation and degradation which destroy forests is not high because the income from such economic activities is not substantial. Hence, the cost for reducing emission from forests is expected to be much less than those of other sectors. Thus, REDD-Plus is expected as a mitigation option that can be started immediately with high cost-efficiency.

International negotiation on REDD

REDD-Plus had been discussed internationally under UNFCCC. At the beginning, only the restriction of deforestation was discussed. In the course of the discussion, it was realized that forest degradation had been a large source of GHG emission but had not yet been evaluated, and forest management to avoid forest degradation could have positive impacts for sustaining local livelihood as well as for conserving biodiversity. Because most of the deforestation occurs in countries with large areas of tropical forests such as Brazil and Indonesia, it was agreed to include forest degradation to involve more countries. In the subsequent negotiations, REDD has been expanded to become REDD-Plus, which involves the conservation of forest carbon stocks, establishment of sustainable forest management, and enhancement of forest carbon stocks.

Co-benefits of REDD-Plus

REDD-Plus is expected to promote the following co-benefits. Protecting forests under REDD-Plus may promote forest ecosystem services such as biodiversity etc. Co-benefits also include the improvement of local livelihood, protecting human rights, improvement of forest governance, economic development of rural area, etc. Forest conservation may enhance the ability of the forest-dependent people as well as that of the ecosystem to adapt to climate change.

Activities of REDD-Plus

As listed in its name, REDD-Plus has the following activities: reducing emission from deforestation and forest degradation, increasing removals by enhancement of forest carbon stocks, forest conservation and sustainable management of forest. These activities include monitoring forests and their carbon stock, identification and agreement on ownership of forest carbon, fair distribution of financial

incentives among the stakeholders, and introducing reduced impact logging. In addition to those forestry activities, there are REDD-Plus activities of non-forestry sectors such as appropriate policy change to prevent agricultural expansion to forest areas, introducing energy-efficient stove or alternative energy to reduce fuel wood consumption. REDD-Plus activities should be planned within the national development plan as part of the Nationally Appropriate Mitigation Action (NAMA).

Research activities for REDD-Plus

To implement REDD-Plus, it is an urgent need to develop the 'measurement, reporting and verification' (MRV) system of monitoring greenhouse gas emissions and methodologies to establish reference levels of emissions. Using a balanced approach of remote sensing and ground measurements, a cost-effective monitoring system for REDD-Plus shall be developed. This monitoring system shall be developed to provide reliable and transparent information on areas and distribution of forest types with their carbon stocks within a country.

Research on the drivers and factors of land use change, deforestation and forest degradation from a socio-economic perspective is required to propose effective policy measures for REDD-Plus. Analysis on the socio-economic risks that might be caused by REDD-Plus should be conducted to set proper safeguard measures.

Although REDD-Plus was designed at the national level, voluntary activities at project level are ahead of national level activities because of the delay in global negotiation and a missing national MRV system. While the negotiation on climate change moves very slow and it is difficult to have a system to issue tradeable credits, which are granted by calculating carbon emissions from forests at the national or sub-national level, it is still under discussion as one of the probable methods to provide incentive for REDD activities under the Framework Convention on Climate Change. Meanwhile, voluntary efforts to grant credits to participants in REDD-Plus activities based on the guidelines and methodologies developed by individual organizations have already started. It is important to develop a way for integrating such project level activities to the credit system at the national level in order to guarantee that the REDD-Plus mechanism contributes to the reduction of greenhouse gases in a fair and transparent manner.

The REDD Research and Development Center of FFPRI

The REDD Research and Development Center (REDD RDC) was launched within the Forestry and Forest Products Research Institute (FFPRI) as a comprehensive technological research base on REDD-Plus of Japan. The REDD-RDC aims to provide the observational system for monitoring tropical forests in cooperation with other countries and for Japan to become a leading country to be able to establish the scientific accounting methods on the amount of CO_2 absorption/emission. For this purpose, REDD-RDC is conducting the abovementioned researches with its research partners. In addition, the REDD-RDC will actively bring up the technical experts to promote support for the private sector's efforts in forest conservation and regeneration. While REDD-Plus requires the activities of the non-forestry sectors, it is expected to enhance cooperation not only with other forestry research institutes but also cross-sectoral initiatives with other research fields such as agriculture, rural development, and socioeconomic policies in developing countries.

Takeshi Toma
Forestry and Forest Products Research Institute, Japan
http://www.ffpri.affrc.go.jp/redd-rdc/en/index.html

JIRCAS Newsletter
Japan International Research Center for Agricultural Sciences (JIRCAS)
November 2011-No.62
Information and Public Relation Office
1-1,Ohwashi, Tsukuba, Ibaraki 305-8686, JAPAN
Phone; +81-29-838-6709 Fax; +81-29-838-6337 http://www.jircas.affrc.go.jp/