

The Joint Research Project of the Thailand Royal Forest Department and
the Japan International Research Center for Agricultural Sciences

Work plan

Improvement of utilization techniques of forest resources to promote sustainable forestry

Project Background

The forest coverage declined from more than half to 26 % in 1993, only within about three decades in Thailand. Government has been recognizing the urgent need of land and forest conservation upon this critical situation of deforestation, and established a national policy on forest conservation and restoration of forest land as its main policy and launched on involving local people to forest management. As the measure, Royal Forest Department had launched on the project to promote the involvement of local farmers in re-forestation in 1994. The enactment of Reforestation Act in 1992 supported to establish the private forested plantation of indigenous valuable timber tree species mainly of teak, owned by farmers.

These plantations were established during the period in whole Thailand, including Northeast region. They are around 20 years old teak stands in age planted by farmers at the present and have grown up to ready to use. Marketing development for that timber, therefore become important for sustain forestry. Another case can be found in community forests supporting livelihood of local people. Besides of studying their role quantitatively, the recent global interest in conserving forest to contribute the scheme of “Reduction of emission from deforestation and forest degradation: REDD” also possibly can be an attractive incentive in near future.

These possible incentives will be improved by the forest management based on the appropriate evaluation of actual management and utilization. Developing measures to support the forest management through sustainable use of forest resources are therefore urged.

Project Objectives

The present collaborative project aims to evaluate and improve forest

utilization which supporting livelihood of local people with both of plantations and community forests. In this context, we emphasize on the development of both user friendly tending techniques and way to encourage market rising for newly established plantations of indigenous economically high valued species, e.g. teak plantations in northeast Thailand owned by local people. We also focus on the evaluation of the capacity of carbon sequestration which recently arose to be the global issue relating to climate change as the possible incentives to local people from forests surrounding village. Through this operation, we present the allowable amount of forest products harvested in sustainable way.

Overall Goal

The project develops the techniques to promote sustainable use of rich forest products from plantations of valued indigenous trees and community forests supporting livelihood of local people in Thailand.

Project Name

Improvement of utilization techniques of forest resources to promote sustainable forestry

Study-implementing Agencies

Japan Side: Japan International Research Center for Agricultural Sciences (JIRCAS), Forestry and Forest Products Research Institute (FFPRI)

Thai Side: Royal Forest Department (RFD)

Project Period

This research launches in 2011 and continues until March 2016.

Concerned Field

Teak and other indigenous tree plantation and community forests in Thailand

Study Subject 1

Stabilization of teak plantation management

Objectives of the Study

The project develops some affordable management techniques for farmer owned Teak plantation including silviculture and regeneration methods as well as the measures to add high value to teak products and to stabilize trading.

Research Plan

The project develops the measures to support the stabilization of Teak plantation management owned by farmers newly established in Thailand with improving affordable techniques e.g. high productivity techniques including low cost regeneration, suitable evaluation techniques including site productivity and teak stand growing stock and analyzing the possible hazard to promote trading forest products.

Scope of the Study

Fiscal year	2011	2012	2013	2014	2015
1. High productivity techniques					
1) Coppice growth performance	1	1&2	2&3	2&3	2&3
2) Thinning method	1	1&2	2	2	2&3
3) Yield table improvement	1	1&2	2	2	2&3
4) Soil improvement	1	1&2	2	2&3	2&3
5) Clone performance	1	1&2	2	2&3	2&3
2. Resource evaluation techniques					
1) Large scaled stock estimation	1&2	1&2	2	3	3
2) Site productivity	1&2	1&2	2	3	3
3. Teak products Market		1	2	2&3	3

Note)1: Plot establishment, 2: monitoring, 3: analysis and evaluation

Study Subject 2

Evaluation of carbon sequestration capacity and allowable forest products harvested from private plantations and community forests

Objectives of the Study

The project aims to evaluate carbon sequestration capacity in the plantations and community forests, and estimate allowable harvest amount from the viewpoint of carbon. These results would contribute toward motivating local people to manage their forest, not only for harvesting forest products but also for possible new incentives from the REDD-plus mechanism.

Research Plan

The project establishes plots in indigenous tree plantations, e.g. teak, dipterocarp, legume, and community forests, determines stand structure with tree census, determines growth for dynamics analysis and estimates carbon stock for further credit accounting. Data gathered from available carbon study will be used for determining amount of allowable forest products harvest. Information on the actual demand on wood and other forest products by local people on species, size, quantity and quality shall be considered. And role of teak plantation regarding carbon sequestration will be clarified.

Scope of the Study

Fiscal year	2011	2012	2013	2014	2015
1. Stand dynamics by management					
1) Stand size structure	1&2	1&2	2	2&3	2&3
2) Growth performance			3	3	3
2. Estimation of forest carbon storage					
1) Stand structure	1&2	1&2	2	2&3	2&3
2) Allometry determination and carbon stock evaluation	1&2	1&2	2	2	3
3. Allowable harvest of forest products					
1) Usage of forest products	1&2	1&2	2		
2) Allowable harvest estimation			2	2&3	2&3

Note)1: Plot establishment, 2: monitoring, 3: analysis and evaluation. Sites will

be selected both in plantations and community forests.

Addendum

This project will be implemented under the Memorandum of Understanding (MOU) between the Royal Forest Department and the Japan International Research Center for Agricultural Sciences that became effective on 5 August 2004.

This document has been signed by the following two persons, who the nominated representatives of the Royal Forest Department and the Japan International Research Center for Agricultural Sciences.



Masayoshi Saito
Program Director
JIRCAS



Malee Sriratanatum
Director, Forestry Research and
Development Bureau
RFD

Date: September 20, 2011

Date: 29/09/2011

Appendix

Details of the Subjects

Study Subject 1

Stabilization of teak plantation management

Background of the Study

There is a plenty of farmer owned teak (*Tectona grandis*) plantations of around 20 years in stand age established in northeast Thailand of which planted under the support of government in early 1990's. The acreage of planting reached to nearly 400,000 ha and about half area of plantations is still growing. These plantations can be one of the possible high incentives to local people to sustain forest when forestry can be installed as the entire system covering planting, tending, harvesting and marketing. Many techniques and tools are required to support to plant forestry as the system. RFD, together with JIRCAS has organized joint study project to tackle with this hard challenge in 2006. And the project has been accumulating many useful knowledge and developed several techniques and tools. The goal to establish sustainable teak plantation management in northeast Thailand is, however, still far and many issues need to be studied further.

Method of the Study

1. High productivity techniques for teak plantations

Teak plantations in various stand age applying regeneration by coppicing will be selected as study sites. Growth performance of coppice will be studied for low cost regeneration method. Also thinning method and improving yield projection table with thinning techniques, clone seedlings and influences of soil improvement treatments will be studied by monitoring and analyzing growth performance of experimental plots as follows,

- 1) coppice growth performance
- 2) thinning method and improving yield projection table with thinning techniques
- 3) soil improvement method including fertilizing
- 4) clone growth performance.

2. Suitable evaluation techniques for growing stock and site productivity of teak plantations

Techniques to evaluate the distribution of teak plantations and to support planning teak plantation management will be developed with applying remote sensing and ground truth surveys including growth, soil and site conditions, that is,

- 1) developing methods for large-scale detection of teak plantations with high efficiency, and for estimating growing stock using practical microwave remote-sensing,
- 2) developing site productivity estimation techniques for teak plantation related to site environmental factors.

3. Analyzing the possible hazard to promote trading teak timber products

Market research on teak plantation timber characterized by small size or young age from shorter rotation will be conducted in Thailand by means of questionnaire and interview surveys. It will clarify market need/demand and tasks for teak timber products. Also mechanism of distribution to make circulative will be analyzed. The possible measure to the market development will be urged.

Study Subject 2

Evaluation of carbon sequestration capacity and allowable forest products harvested from private plantations and community forests

Background of the Study

In the 13th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP13), the decision was made to consider Reducing Emissions from Deforestation and Forest Degradation (REDD) that is mechanisms providing economic incentives by forest conservation. Additionally, category of sustainable forest management and enhancement of carbon stocks was also added to REDD-plus. This category has a possibility to give economic incentive to local people by control wood

harvest. Therefore, it is necessary to estimate carbon storage in managed forests, i.e. plantations and community forests, and develop forest management systems, including carbon stock control.

Methods of the Study

1. Comparison of tree growth and forest structure among different forest managements

Mean diameter at breast height (DBH), mean tree height (H), size distribution and tree growth will be compared among different age, spacing and site condition in plantation forest. In addition to these measurements, species composition will be studied in community forests. Project launches on research plot establishment in indigenous tree plantations, e.g. teak, dipterocarp, legume, and community forests.

2. Estimation of carbon storage in farmer's plantations and community forests

Carbon storage amount will be estimated in indigenous tree plantations and community forests. To estimate carbon stock, allometric equation will be developed for plantation forest. After measurement of DBH and H, the target trees will be felled, and dry weight (DW) of the each organ will be measured to make the equation. The relationship between stand biomass and age will be analyzed as well as on the difference among sites.

In community forests, carbon stock will be estimated by data of stand structure. Wood samples will be collected to check the specific gravity of wood.

3. Estimation of allowable harvest of forest products for sustainable use

Biomass increment in the stand will be estimated from biomass and re-census data in the research plots. Allowable harvest intensity of plantation i.e. interval, size selection and amount, will be estimated. In community forests, estimation of carbon stock and the increment will provide the data of allowable harvest amount of forest products that local people utilize from the forest, e.g. branches for charcoal, non-timber forest products. Estimation of allowable harvest will contribute to develop sustainable forest management and apply data to REDD-plus mechanism.