

3 PROBLEMS TO BE ADDRESSED AND THE CURRENT SITUATION

3.1 Institutional Framework for the Project Issues

Deforestation and poverty in Dry Zone are the two main issues that should be addressed by the prospective Project. FD, DZGD, and MAS are the main governmental organizations that manage these issues.

In the Dry Zone, both FD and DZGD are engaged in planting, forest conservation, and awareness raising of local people. Although their demarcation is complicatedly defined, FD deals with promotion and approval of the community forest. FD Division offices are empowered to register forest groups, however, not so many groups have been registered. MAS has many offices throughout the Dry Zone and works on improving agricultural productivity, which has an important link with community forest.

Information on the relevant organizations is shown in ANNEX 7.7.

3.2 Problems to be addressed: the Current Situation

From the analyses so far, problems to be addressed by forestry extension in Dry Zone are summarized as follows,

1) Forest degradation is caused by extensive land use

Deforestation is caused by agricultural development and grazing, which are the major livelihood of local people. Population pressure is another cause of excessive utilization of forest products.

2) Many households including landless farmers are in poverty

Basic human needs, such as food, fuel, water, education, health, electricity, etc. do not meet the demand of the villagers. Agricultural productivity of Dry Zone is very fragile due to the unstable natural conditions, which prevent sustainable life. Poverty and environmental degradation form a vicious circle of underdevelopment.

3) Few forest resources are accessible by communities

Forests have been managed by the public sector and forest resources are often restricted to the local population. Farmers use the residue of agricultural products to complement firewood, which deteriorates the productivity of the farmland.

4) Experience in participatory forest management is limited

Even though CFI was issued in 1995, there are very few Community Forests established in Dry Zone. Many officers of the Ministry of Forestry understand the importance of this change of policy. However, they cannot strongly promote this program partly because of the lack of appropriate know-how.

5) Extension system for participatory forest management has not been fully established

In the Aftercare program of the CFDTTC project, some 120 officials have completed the courses “Forestry extension” and “Extension method” that target the CFI promotion. However, Most of them seem not be able to do extension activities with the knowledge gained in the course because the extension mechanism has not fully established yet.

4

PROJECT STRATEGY

4.1 Project Approach

Poverty and environmental degradation are the two major issues in Dry Zone. A vicious circle is formulated between these two issues. However, poverty and environmental degradation derive from many factors and it is not realistic to address all the factors in a limited project period.

The strategy of this Project is to mitigate poverty and environmental degradation to a certain extent through appropriate management and sustainable utilization of forest and its products with the initiative of local communities. Concerning appropriate forest management, FD and other public organizations have been taking many measures. Particularly, FD issued Community Forest Instructions (CFI) to promote forest management by community participation. The purpose of this Project is to make CFI work effectively in Dry Zone.

CFI has unique and epoch making topics in the environmental conservation policies, since it is based on the community participation, which is a relatively new idea to the forest policy in Myanmar. In the past, people's access to the forest and its products had been restricted. If CFI works efficiently, communities can gain new options of legal and sustainable access to forest resources.

The Project will develop practical capacity for the effective extension activity through various training seminars, practical trainings, and planning of "institution" building for the extension system.

4.2 Project Strategy

The objective of this Project is to overcome shortcomings that are mentioned in Chapter 2.4.2 to successfully implement community forestry extension. The new project aims to improve the extension campaign through the following strategies.

a) Supervisors' understanding and clear instructions

Besides the training program for the extension officers, this project conducts a course for senior officers (i.e. supervisors of extension staff at FD township office). This course enhances the understanding of the supervisors of frontline offices. The Director General of FD and its administration will encourage senior officers to issue clear instructions for the extension of community forest. The performance of this extension work shall be evaluated as the achievement of each FD township office.

b) On-site pair training of extension work

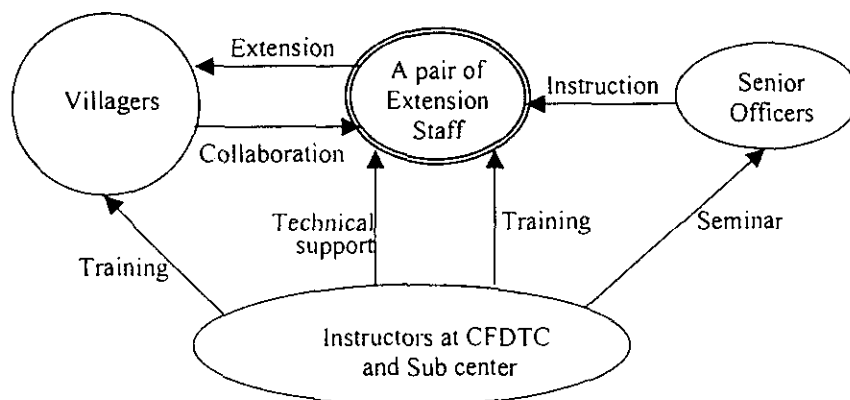
To enhance the extension workforce in each FD township office, two officers from each

township office should simultaneously attend the course. The prospective training course for extension staff consists of two parts. The first part is lectures in the CFDTC classroom. And the second part is on-site training, which takes place in a selected village of each township. After the training in CFDTC, each pair of trainees goes back to their township office and is obliged to work on a village to facilitate the community to formulate a forest group. CFDTC or its sub-center at Mandalay organizes an instructors' team to support the practical training. Follow-up training will also be held to evaluate the proceeding extension work and to consult on practical problems in the selected villages.

c) Farmer's participation

To support the participation from the target group of the Project (i.e. farmers in Dry Zone), this project uses two tactics. Firstly, a community forest training course for farmers will be organized. CFDTC has been conducting a regular course called "Local Community Development Training Course" which accepts farmers as trainees. A new course for farmers will be carried out specifically for the extension of participatory forest management, based on the experience of the above training course. The attendants of this farmer's course shall be nominated from the selected villages of each township in Dry Zone. Landless farmers and women should be encouraged to attend the course. Secondly, the Participatory Rural Appraisal (PRA) workshop is held at an early stage of the on-site-training in the selected villages. PRA is a method to evaluate an area and to identify the needs of its inhabitants. The workshop expects villagers to take the initiative in confirming their needs. Extension staff should understand the farmer's desire and consider how the community forest can contribute to the solution of their problems.

Figure 4.1 Working environment of extension staff



The Figure 4.1 summarizes the project strategies and illustrates the working environment of the extension staff at FD Township Offices. The each pair of extension staff can implement extension in a sufficient working environment where they get training, technical support, instruction and collaboration. This may improve the morale and the motivation of the extension staff.

4.3 Special Consideration

Community forest management is a relatively new attempt to preserve the forest. Since the social aspect is very important for this participatory management system, the following issues should be carefully considered and examined regularly. Otherwise the Project might cause negative socio-economic impacts.

4.3.1 Spontaneous Organization of the users' group of the community forest

Formulation of the users' groups should be based on the villager's good understanding of the program and of their own intentions. Any compulsory action should be avoided in the process of community forest establishment. Basic idea contained in CFI is to promote active participation of villagers based on their daily needs and spontaneous intention. This idea shall always be recalled in each stage of the Project activities.

4.3.2 Gender Issue

If appropriately applied, CFI would deliver more benefits to women in village communities, since using firewood for cooking food and processing jaggery (sugar from palm tree) and deep-fried confectioneries (made from onion) are traditionally women's work. Women need forest. On the other hand, men mostly conduct important decision-making within village communities. Women are, in many cases, excluded from the decision-making process and their opinions are seldom taken into consideration. As they are the important beneficiary segment of the Project, women's opinions should be carefully reflected to the management of the community forests. Special arrangements should be made, such as holding a women's meeting separately for issues such as the selection of species to be planted.

4.3.3 Participation of Landless Farmers

Landless farmers have more intensive needs for forest products than land holding farmers, because landless farmers have limited access to firewood and the various by-products of trees. Allocation of forest as community forest to the landless farmers would provide certain benefit and reduce income gap in the village communities. Therefore, the landless farmers or the low-income segment of communities should be targeted as the beneficiary group of this program. Excluding them from the program will result in negative social impact, i.e. widening income gap in communities.

4.3.4 Mitigation of Land Use Conflict

Under the CFI, the users' group members will be entitled to exclusive use of the allocated forest, and get benefit from it. Such allocation might mean shutting out other people of the community from the forest, and only limited farmers can access to forest for firewood, agriculture, livestock farming and so on. The users' group and their territory should be very carefully organized and designed so that they do not disturb the current beneficiaries of the forest. A public hearing as a procedure of community forest approval can be one system to avoid land conflicts.

4.3.5 Establishment of confidence between Forestry Department and Communities

Putting priority on the benefit of the local community is the most important approach of the

community forestry extension work. As the idea of participatory forest management is relatively new to the Forest Department, alliance between FD and the local inhabitants has not sufficiently matured. For the promotion of the community forestry, FD and DZGD are expected to better understand the viewpoints of the local inhabitants and try to account local people as partners of forest management. Study methods such as PRA (Participatory Rural Appraisal) can be the tools to identify the true needs of the community. Collaboration with other sectors (agriculture, education, health) is also important to effectively tackle the needs of the people. Through these efforts, alliance between FD and local people would be established.

The situation of the above issues ought to be monitored regularly as a part of the Project activities. Necessary action should be taken to re-design the project so that the project can facilitate appropriate social development.

4.4 Collaboration with relevant Institutes and Projects

There are some relevant organizations and projects that the prospective Project should make collaboration with.

1) Another division of Ministry of Forestry, and MAS

Even though the training of the extension officers is conducted in the CFDTTC, suitable lecturers can also be found from outside of CFDTTC, such as the Forestry Institute, and local offices of FD. Officers of MAS who are experienced in agro-forestry or participatory community development may make good visiting lecturers.

2) Japanese Grant Aid Project

A Japanese grant aid project named "Project for Afforestation in Central Dry Zone" is under preparation. The planting will start in 2003. This project has many common technical issues with the prospective "Community Forestry Training and Extension Project." Exchange of information between the two projects is therefore recommended. If part of the forests established by this Grant Aid Project is to be transferred to the management of the local residents' group as community forests, the Project will provide some support to DZGD staff in the target area in terms of training and technical assistance.

3) UNDP (FAO) project

This project, with a community oriented and multi-sector approach, suggests much on how to improve the living standards of the local population through empowerment of the community. This project has formulated a significant number of community forests in the last two years. The staff of this project have very good experience and can make good lecturers for the prospective training courses and members of the supporting team for the on-site extension training. The UNDP project sites can be a good excursion destination for the training.

4) DZGD

Implementation of adequate training to officers and local residents is just half way to the complete promotion of the community forestry. Practical extension work is the most important

part of the promotion of the community forestry. DZGD is the biggest planter in Dry Zone. It has been planting more than 35,000 acres (14,175 ha) every year since 1998. FD and DZGD should make a close collaboration to identify suitable land for the community forest and reserve it for the CFI program. Also, DZGD has a 30-year plan to allocate 1,200,000 acre (486,000 ha) of forest for users' groups. The community forest program based on the CFI will be promoted much more effectively in alliance with DZGD.

5. PROJECT DESIGN

5.1 Overall goal

[Overall goal]

Forest Department (FD) promotes participatory forest management in Dry Zone based on the Community Forestry Instructions (CFI) so that people with voluntary participation are able to enjoy benefits from the Community Forests.

“Overall goal” in Project Design Matrix concerns the development effect expected as a result of the achievement of the Project Purposes. The overall goal of this Project is for the target group to enjoy benefits from the Community Forests. Benefits are detailed in Chp. 6.1.1 3). This overall goal can be attained only if FD continues its effort on the extension and support of community forest even after the termination of the Project. The Project is an initial part of the long efforts in the popularization of the community forestry.

[Indicators]

- 1) 80% of community forests established during the project period continue to be managed by users' groups as of 2011.
- 2) New community forests continue to be established in more than 50% of Townships in Dry Zone after the termination of the Project by 2011.
- 3) Forest Products are utilized at least by 10 users' groups which are initiated by the project in 2011.

These indicators concern sustainability. Indicator 1) expects that the majority of the community forests are still functional in 2011, i.e. after five years of Project termination. Indicator 2) anticipates that FD's extension work will still be active and achieving significant performance in terms of community forest formulation. Lastly, indicator 3) means that 1/3 of the community forests become matured enough in 2011 (five years after the project termination) for the participants to gain considerable benefit from the forests that they are taking care of.

5.2 Project Purpose

[Project purpose]

All FD Township Offices in Dry Zone acquire practical capability to promote participatory forest management based on CFI.

“Project purpose” should be achieved by completion of the project. The purpose of this Project is that FD's frontline offices have practical ability in terms of community forestry promotion. The basic approach of this project is training. The training program includes very practical on-site-training that takes place in selected villages in the Townships of the trainees. The “practical capacity” should be demonstrated through the actual formulation of the forestry groups in the selected villages.

[Indicators]

- 1) Community Forests are established in more than 50% of the townships in Dry Zone.
- 2) Spontaneous participation in users' group is secured in the process of establishment of community forestry.
- 3) 90% of the ex-trainees are still active in CFI extension work 1 year after the training at CFDTC.

Indicator 1) expects half of the on-site-training and subsequent extension works in their Townships to get successful results. The figure "50%" means 29 townships, out of 57 townships in Dry Zone in total. This target number is set on the conservative side. The figure might be reassessed in the course of Project implementation.

Indicator 2) shows capability of extension staff in FD township offices to promote voluntary participation of local people into users' groups of community forests.

Indicator 3) looks forward to keeping the extension staff in FD township offices active even one year after the training at CFDTC.

5.3 Project Outputs and Activities

[Outputs]

- (1) An extension plan for promotion of participatory forest management in Dry Zone based on the Community Forestry Instructions is prepared.
- (2) Extension staff understand the importance of participatory forestry management and acquire necessary skills and knowledge for extension through training.
- (3) Extension of participatory forest management is practiced in villages in Dry Zone as a part of extension staff training.

"Outputs" are defined in PCM as the concrete objectives that come as results of project activities and lead to the Project Purpose achieved during the project period.

The first output from the Project is an extension plan. Since CFI was issued in 1995, significant efforts have been made in the training aspects. However, there have been no goal setting and no resource allocation for the extension of community forest. An extension plan will be made to connect the training program and practical extension. This plan may include;

- 1) Appropriate extension procedures and methods
- 2) Institutional set-up of the extension program with functions of each party concerned
- 3) Number of potential villages where Community Forest is feasible
- 4) Necessary knowledge and skill for extension staff, their senior officers, and villagers.
- 5) Term, scale, and frequency of the training courses at CFDTC and its sub-center.
- 6) Contents of on-site-training program and support from instructors' team
- 7) Necessary inputs for extension work (manpower, budget, technical assistance, seedlings, equipment, etc)

The second output from this project is well-trained extension staff for community forest. This

output has been achieved to some extent, since CFDTC conducted relevant training courses. What are needed for the next stage are practical knowledge and the well-organized setting of on-site extension work.

The third output supplements the important connection between classroom training at CFDTC and practical extension work on site. For this on-site training, extension staff and the instructors' team will go into the selected villages and directly contact with farmers. This activity is practical extension work as well as extension training. To encourage farmers to formulate forest groups effectively, the extension staff should know the actual situation of the selected village, the needs of the farmers, and how the community forest can address their needs

[Indicators for Output]

- 1) An extension plan is authorized by the Forestry Department. (By the end of the second year)
- 2-1) Adequate numbers of qualified instructors are assigned.
- 2-2) All trainees pass the achievement test at the end of training course at CFDTC
- 2-3) CFI Extension manual is prepared (by the end of the first year)
- 3-1) CFI manuals for villagers are prepared (by the end of the first year)
- 3-2) 80 percent of trainees are engaged in extension practice
(6 months after each training course at CFDTC)

Six indicators are selected for the monitoring and evaluation of the three outputs. Some of the indicators concern a plan and manuals. The quality standard of these documents should be carefully examined later so that they work practically.

[Activities]

- 1-1) To study the current extension system
- 1-2) To identify adequate extension procedures and methods
- 1-3) To work out a desirable institutional set-up for extension
- 1-4) To identify geographical priority areas for extension
- 1-5) To identify required skills and qualification of an extension staff
- 1-6) To formulate a training plan.

- 2-1) To train trainers, lecturers, and instructors
- 2-2) To formulate training curriculums
- 2-3) To develop training materials including an extension manual
- 2-4) To conduct training courses for the following categories of personnel
 - Extension staff in frontline offices
 - Managers / Supervisors of extension staff
- 2-5) To conduct evaluation of training courses

- 3-1) To prepare manuals for villagers on CFI
- 3-2) To instruct and assist extension staff who are engaged in extension practices at the following stages
 - Preparation of action plan for extension practices
 - Identification of possible target villages

- Explanation on CFI to villagers and inquiry of their willingness to establish community forests
 - Provision of assistance to villagers in identifying adequate site for community forests
 - Provision of assistance to villagers in organizing users' groups
 - Provision of seed and Seedling to villagers
 - Technical guidance in the field to villagers
- 3-3) To conduct follow-up training for extension staff
 - 3-4) To conduct seminars for villagers on CFI and necessary forestry technique
 - 3-5) To conduct evaluation of extension practices
 - 3-6) To conduct evaluation of performance of users' groups and their community forests.
 - 3-7) To review the extension plan based on the experiences of extension practices

“Activities” are specific actions intended to produce the Outputs of the project by effective use of the Inputs. Activities 1-1) to 1-6) correspond to the Output 1), and Activities 2-1) to 2-5) correspond to the Output 2), and so on.

5.4 Strategy of Project Implementation

The following is the stages of the community forestry extension.

Stage 1: CFI extension training at CFDTC

The training on CFI extension methodology and skills is conducted at CFDTC for the trainees from Township offices of FD. A pair of extension staff from each Township office will participate in training. CFI extension seminars for senior officers (supervisors of the prospective extension staff) are also conducted at CFDTC.

Stage 2: CFI extension practices on-site

CFI extension on-site training of the extension staff is conducted in selected villages with the participation of villagers. An instructors' team is formed to support, instruct, and supervise the extension staff on-site. This on-site training itself is a practical CFI extension activity.

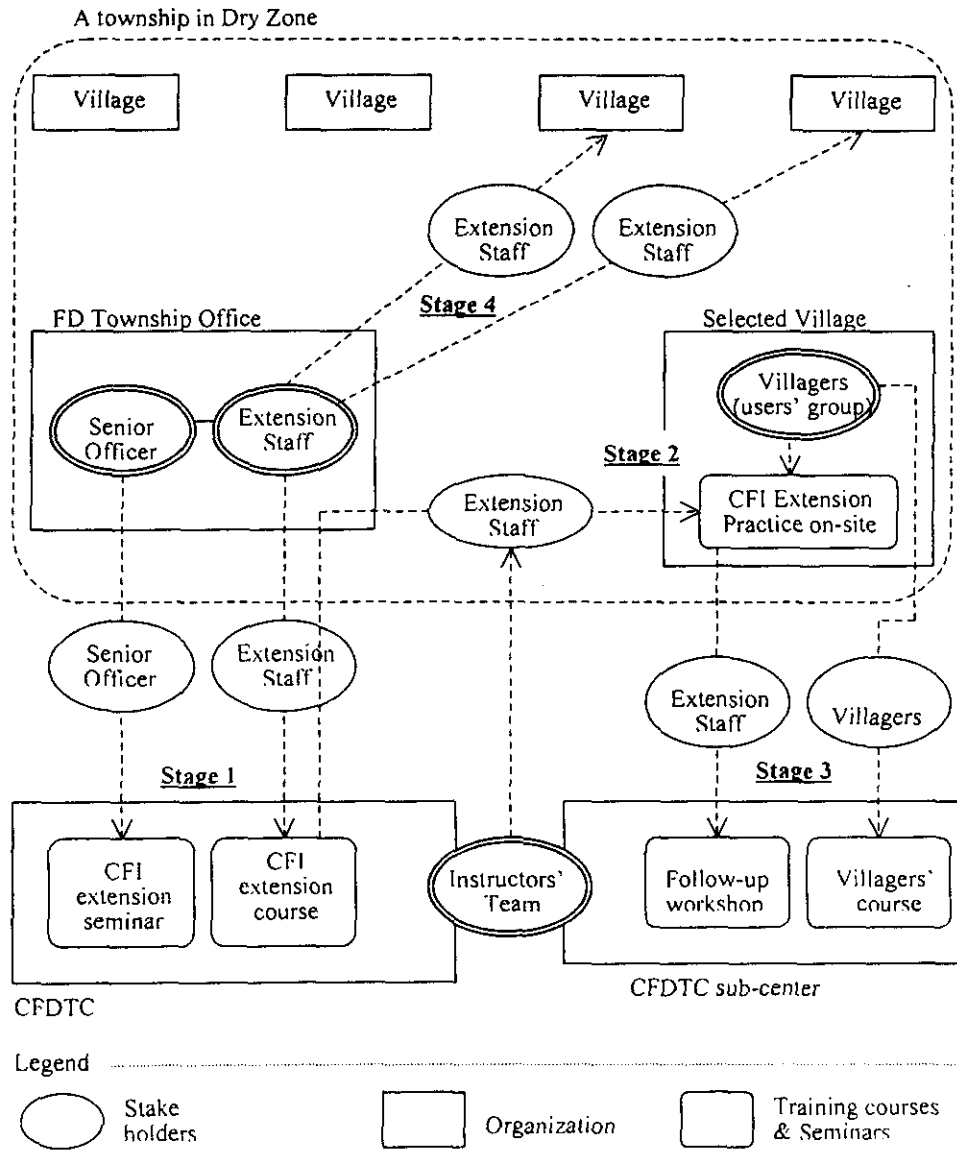
Stage 3: Follow-up workshop and villagers' training course at CFDTC sub-center

In the course of on-site extension practices, follow-up workshops are held for extension staff at CFDTC sub-center. Villagers' training courses are also conducted to support the activities of extension staff.

Stage 4: Full scale extension work

Extension staff continuously facilitate community forestry in the other villages in their Townships with improved understanding of their supervisors and villagers. CFDTC provide necessary support to extension staff in each phase of the extension.

Figure 5.1 Framework of the community forestry extension



5.5 Inputs

Inputs include the personnel, equipment, facilities, and costs required for each of the Project Activities. Myanmar and Japanese sides will jointly share the expenditure for the Inputs. Breakdown of the Inputs are shown in ANNEX II Project Design Matrix.

5.5.1 Inputs from Myanmar Side

1) Personnel for the Project

1. Project Director: Director General, Forest Department (FD)
2. Deputy Project Director: Director, Training and Research Development Division, FD
3. Counterpart personnel:
 - a) Training and Research Development Division, FD
 - Manager for extension planning
 - Staff for extension planning
 - b) CFDTTC
 - Manager for training planning and coordination
 - Staff for training planning and coordination
 - Staff for curriculum development
 - Staff for training material development
 - Staff for training administration
 - Lecturers
 - Instructors
 - c) CFDTTC Sub-center
 - Manager for CFI extension practice
 - Technical Supervisor for field extension practice
 - Staff for extension practice
 - d) Administrative personnel
 - Administration staff
 - Secretaries
 - Drivers
 - Other necessary supporting staff

2) Trainees

1. Extension Staff

FD will nominate staff of Township offices in Dry Zone as trainees. They are expected to become extension staff. They will first attend a training course at CFDTTC, and then conduct extension practices as a part of training (On-the - Job Training) after they return to their Township offices.

2. Supervisors of extension staff

Heads of Township offices, whose staff are nominated as extension trainees, and other supervisors in District and Division offices will participate in workshops on the instruction and support of the extension practices for their extension staff.

3) Land and facilities

1. Land for;
 - a) CFDTC
 - b) CFDTC sub-centre
2. Buildings and facilities for;
 - a) Project office at CFDTC
 - b) Training facilities at CFDTC
 - c) Administration facilities at CFDTC
 - d) Project office in FD
 - e) Project field office at CFDTC sub-center
 - f) Training facilities at CFDTC sub-center

4) Project operation budget

1. Budget for training implementation
2. Budget for field extension practices, including travel allowances for extension practices as On-the-Job Training
3. Other necessary budget for the implementation of the Project

5.5.2 Inputs from Japanese Side

1) Long term experts

A chief advisor, a coordinator, and three experts shall be dispatched on a full time basis during the Project period. The Chief Advisor may serve concurrently as an expert.

2) Short term experts

Short-term experts may be dispatched when necessary. The following are suggestions for the technical field of short-term experts.

- 1) Dry zone Sylviculture
- 2) Nursery technique
- 3) Training curriculum development and training method
- 4) Development of teaching materials
- 5) Extension method
- 6) Participatory forest management
- 7) Social economic survey
- 8) Agricultural technology
- 9) Income generation

3) Counterpart training in Japan

2-3 counterpart personnel per year will be sent to Japan for training.

4) Equipment

- 1) Equipment for
-Training

- Field extension
- 2) Vehicles
- 3) Other necessary equipment for the implementation of the Project
- 5) Infrastructure
 - Construction of CFDTTC sub-center in the compound of FD Patheingyi Township Office
- 6) Training Expenditure
 - If the Myanmar side has difficulty in allocating sufficient budget for the training implementation, the Japanese side will supplement a part of the expenditure.

5.6 Pre-conditions and Important Assumptions

5.6.1 Pre-conditions

“Preconditions” are certain requirements that should be fulfilled before the implementation of this project. One of the reasons why community forestry extension is not always active is the lack of clear instructions from FD to promote CFI. Unless sufficient priority and clear instructions are given to CFI extension, practical campaigning cannot take place at the village level. The project shall start based on the condition that FD has strong motivation for community forestry extension and recognizes the work as a very important part of FD’s mission. Naturally, the instructions should go together with appropriate supports.

Therefore, the precondition of the Project is that “Clear instructions for CFI extension are issued to the extension staff.”

5.6.2 Important Assumption and Risk Analysis

There are some factors that work negatively to the project and cannot be controlled by the project. If they occur the project cannot achieve its outputs and purpose. These factors are called important assumptions.

(1) Important assumption for achievement of outputs

Even though the Project executes all the activities successfully, if the ex-trainees are not in the positions for community forestry extension, training efforts cannot be connected to the successful extension.

Therefore the important assumption for achievement of outputs is “Ex-trainees are appropriately assigned to the posts for CFI extension.” The Project will maximize the possibility of this assumption by conducting a community forest training course for supervisors of extension staff.

(2) Important assumption for achievement of project purpose

Even though the project attains the expected outputs, the following two issues might hinder the achievement of the project purpose.

“Participation to users’ group is not forced.”

“Conflict for land use does not occur because of the community forest.”

The first one concerns the very basic definition of the community forestry. Community forestry groups should be organized without any compulsory orders by the authority. No villager should be forced to join the forestry group. Participatory forestry management is based on spontaneous intention of the village people. This issue cannot be fully controlled by the project and is therefore mentioned here as an assumption.

The second assumption is a social issue that may not be entirely controlled by project activities. With the CFI program, villagers can formulate groups and acquire forest. However, this can be land enclosure and expels other possible beneficiaries of the forest. Therefore the project assumes that this kind of conflict does not occur in the target villages. Careful examinations are requested when FD approves applications of community forest.

(3) Important assumption for achievement of overall goal

Even if CFI is successfully promoted in the target area, and many community forests are approved, there is a risk of natural (or man made) disasters. The project presumes that forests are developed and maintained in a normal condition of the target area. Therefore exceptional incidents cannot be taken into consideration. An assumption for this issue is;

“Drought, fire, harmful insects, and disease do not cause serious damage to forest.”

Furthermore, constant institutional effort by FD is required as an important assumption. Without steady extension efforts, community forest cannot have significant impacts on local communities in Dry Zone.

Therefore, the assumption at this stage is again; “Clear instructions for CFI extension are continuously issued to the extension staff,” which is also the pre-condition of the Project commencement.

(4) Condition to sustain the development effects

The very basic basis of this project is the Community Forestry Instructions (CFI). The goal of the development effort is to materialize and promote CFI. Therefore, what is needed for the sustainable effects of the development effort is;

“FD does not negatively change CFI policy on community forestry.”

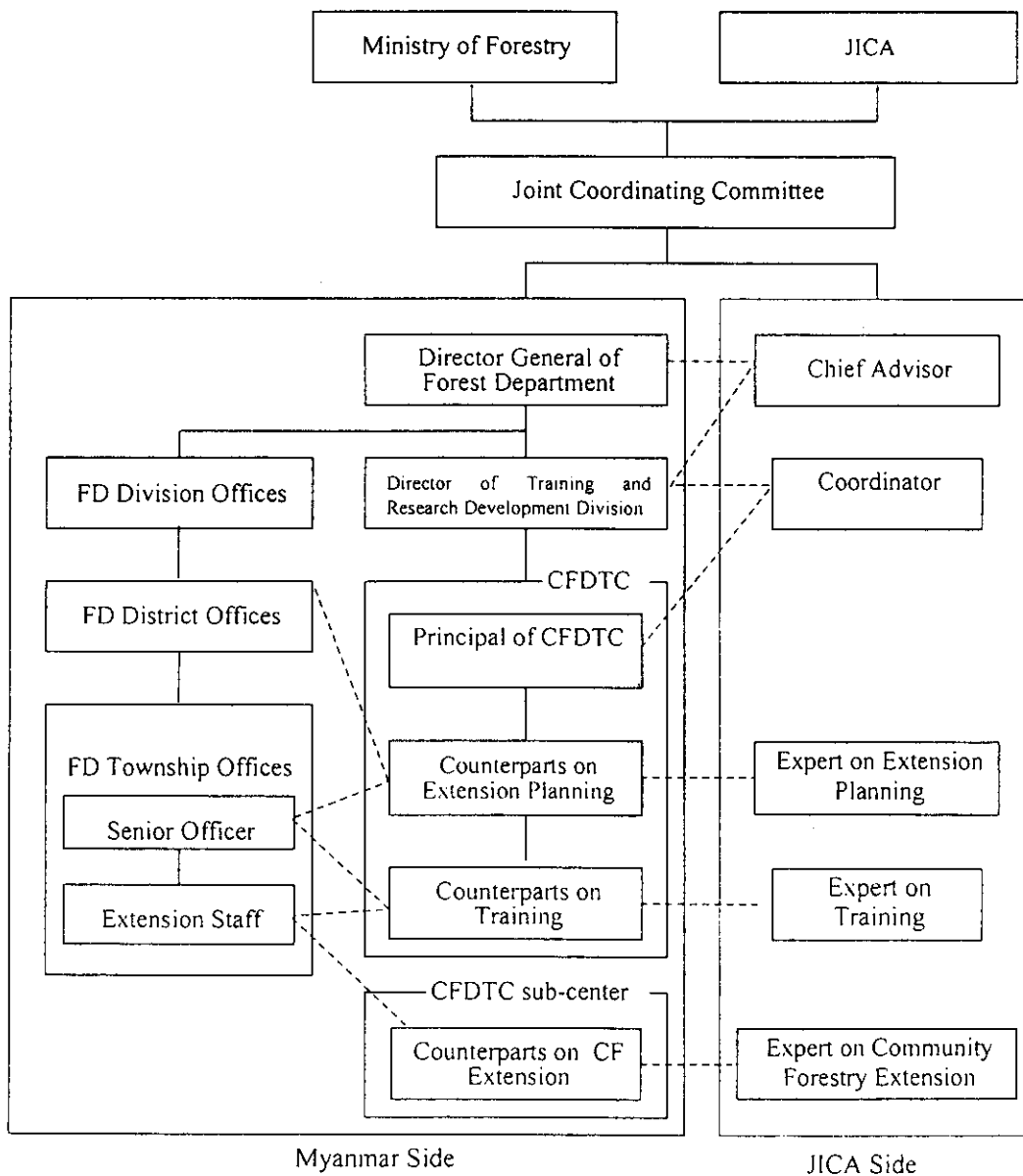
5.7 Implementation System for the Prospective Project

Figure 5.2 shows the structure of the proposed project.

- (1) Director General of Forestry Department will be the Project Director and bear overall responsibility for the administration and implementation of the Project.
- (2) Director of Training and Research Development Division, FD will be the Deputy Project Director and be responsible for the managerial and technical matters of the Project.

- (3) The Japanese Chief Advisor will provide necessary recommendations and advice to the Project Director and the Deputy Project Director on any matters relating to the implementation of the Project.
- (4) The Japanese experts will provide necessary technical advice to the Myanmar counterpart personnel on technical matters relating to the implementation of the Project.
- (5) For the smooth implementation of the Project, a Joint Coordinating Committee shall be established and meets at least once a year or whenever necessity arises. Functions and members of the committee are attached in ANNEX 7.8.

Figure 5.2 Project Implementation Scheme



6. PROJECT JUSTIFICATION

In this chapter, the project plan is examined with five criterion i.e. impact, effectiveness, efficiency, relevance, and sustainability.

6.1 Impact of the Project

6.1.1 Expected Impacts of the project

(1) Impact on the development policy framework

For many years, the public administration of forestry has been making efforts on how to increase forest resources and utilize them. Local residents are often rather obstacles to this mission. The livelihood of the local inhabitants has rarely been addressed directly by the authorities of the forest sector. However, deforestation of Dry Zone is so severe that it is necessary to get participation of local communities by recognizing the needs of the farmers for forest products. Active participation of the farmers in forestry has a potential to improve the situation.

In this context, CFI issued in 1995 is an important turning point for the forest policy as it encourages the participatory forest management. The Government of Myanmar is trying to promote social forestry with the initiative of the local people by addressing their needs. However, in Dry Zone, very few users' groups have been registered except those by the projects of foreign donors. This Project, which includes practical extension activities of community forest, will put the idea of CFI into practice in Dry Zone with a significant scale. In this sense this project will have a big impact on the development policy framework.

(2) Impact on the institutional framework

The purpose of this Project is "All FD Township Offices in Dry Zone acquire practical capacity to promote participatory forest management based on the CFI." This "capacity" means not only that of extension staff but also the capacity of FD as executing institute.

Even though the extension staff will keep contact with selected village communities to empower them, farmers are not motivated for community forestry without being convincing that this program will improve their whole livelihood. The community forestry program would facilitate the collaboration between FD and relevant agencies such as Myanmar Agriculture Service, and Ministry of Livestock and Fishery, to address the villagers needs effectively.

(3) Impact on Socio-economic Aspects

Village people and FD extension staff are the beneficiaries of the Project. Upgraded training

courses would enable extension staff to acquire practical knowledge. Besides, forest management training for village people can facilitate forest groups and make it easier to obtain firewood and other benefits from community forests. Also, soil conservation by covering topsoil with plants will increase crop productivity and increase household income. Environmental effects such as prevention of desertification, bio-diversity conservation etc. can be also expected.

a) Features of beneficiaries

1) Village people

Village people can be divided into several groups. Men and women, land holding farmers and landless farmers. Forest is an important concern of women and landless farmers. It is women's work to collect firewood and use it for cooking and processing Jaggery. A village woman interviewee mentioned that she needed two days to collect firewood that she consumed within 10 days.

Land holding farmers can get firewood from trees around their own land (called "fence forest"). But for landless farmers, access to firewood is much more restricted. They have to go far to get firewood, or ask other households for firewood. Often they use the stems of bean, husk shell as their source of fuel. UNDP study indicates that landless farmers comprise 30 % of total households in Dry Zone. Their income source is limited to tenant farming, daily-based labor, and seasonal employment in the urban area. There is a large difference in income among villagers' households; the income of rich households is as high as four times the lowest one⁽¹⁾. Forest products could make up an additional income resource through livestock farming or Jaggery processing for the farmers who have little farmland.

In the PRA workshop, village leaders would pick up some items such as road, water supply, power supply, health care, and education as their needs. However, forest is a need for women and landless farmers i.e. the silent majority.

2) FD extension staff

Expected extension staff for the community forest are range officers and deputy range officers of FD township offices in Dry Zone. They are engaged in planting trees and taking care of them. In the aspect of extension work, they organize campaigns such as substitution fuel (coal briquettes) and planting ceremony. FD staff consider extension work as enlightenment activity, and many of the officers are not confident that the farmers group can manage forest. Various training courses at CFDTC are offered to them. The most important training course to CFI, "Field level extension method" counted 110 participants from FD and DZGD frontline offices. However, very few of the ex-trainees take part in the practical extension of community forest. More to the point, there is no supporting system established for the frontline staff who are supposed to be engaged in

⁽¹⁾ Interview result of the JICA first preparatory study in Dec. 2000

extension work of community forest.

b) Number of the beneficiaries

The target area of the Project, i.e. Dry Zone, covers 57 townships. The project aims to train some officers of all the 57 FD township offices, and expects community forests to be established in more than 50% of the townships in Dry Zone. In the aspect of training for extension staff from FD Township Offices, the number of beneficiaries is about two or three hundred. These extension staff are expected to formulate at least 30 community forest groups that may include 600 households with 3600 beneficiaries⁽¹⁾. However, if these trials in selected villages work as demonstration projects, many neighboring villages would formulate community forest groups. DZGD has a 30-year master plan to provide as much as 1,200,000 acres (486,000 ha) of forest for the community forest program. If even 10% of this plan is put into practice, the number of beneficiaries becomes 24,000 households or 144,000 persons⁽²⁾.

c) Content of the benefits

1) Staff of FD

With this Project, staff of FD will not only learn the extension methodology of participatory forest management but also understand the importance to make collaboration with the farmers as partners with the same status. Such staff training and institutional building of FD can revitalize good relation and cooperation between residents and FD staff, who used to control villagers by restricting their benefit from forests.

2) Farmers

The overall benefit of the community forest is that farmers can have legal access and control over forest and its products. With legally allocated community forest, farmers can have access to firewood and other forest products without any anxiety. One of the main reasons for deforestation in Dry Zone is development of farmland in forest without consensus of the landowner, i.e. the government, in many cases. Registration of the community forest is a very good chance for such farmers to change the status of the farmland from "illegal" to "authorized." Thus, the benefit of CFI will stabilize the income of the farmers with poorer status and encourage them. Risks to illegal forest use can be minimized.

The followings are breakdown of the expected benefit.

The first benefit of the farmers is that they can easily get firewood from community

^{(1) (2)} Assumptions: 1) One forest group consists of 20 households. 2) One household consists of six members.
3) Five acres of forestland is allocated to each household in community forest groups.

forests. Firewood is necessary for daily cooking and producing jaggery and deep-fried confectioneries. Ample firewood from community forests can save women's workload as collecting firewood becomes easier. Firewood is considered more efficient fuel than cow dung or agricultural residues. Farmers can improve productivity by saving time and get better income by selling more confectioneries.

Secondly, farmers collect timber and poles for housing and other purposes. Poles are used for pillars, and leaves for roofs and walls of houses. The conventional building technology requires only locally available resources to construct houses. Poles and palm leaves are main materials for house making. Timber can also be used for agricultural equipment and facilities such as plough, carriage or fence.

Thirdly, farmers would get food products from the community forestry. Tamarind, mango, palm (fruit, alcoholic drink, sugar) contribute to generating income. Furthermore, forestation will produce non-woody food like mushrooms, bark, honey, roots and leaves. In the case of the agro-forestry, vegetables such as sesame, pea, and corn can be harvested.

Fourthly, farmers can improve the soil productivity of their farmland. Currently, the local people use agricultural residue for fuel as well. This deteriorates the soil productivity, as the organic material does not return to the soil. If people can get enough firewood from the community forest, deterioration of the soil productivity can be mitigated.

(4) Impact on the Technological Aspect

a) Number of target involved in technology transfer

Counterpart personnel of this project consist of three categories. The first category is FD executives. As a firm stance and clear instructions are essential for the extension of the community forest, the chief advisor will consult the executives on institutional building for more effective campaigning of the CFI. The number of counterpart personnel in this category is 5-10, including the Director General of FD, directors of the three division offices in Dry Zone, and others.

The second category is officials of FD. This group includes instructors at CFDTTC (5-10 persons: by the end of first year of the project), prospective extension staff of FD Township Offices (120 persons, by the end of the project), as well as their managers or supervisors (60 persons, by the end of the project). Relevant technology would be transferred from JICA experts to CFDTTC instructors, and from instructors to FD officers. Training courses should be implemented regularly from the second to the last year of the project

The third category is farmers of Dry Zone. One or two persons of prospective community forest groups in selected villages will participate in the farmers course community forest program. The other group members participate in both the PRA workshop and the consequent meeting held in their village as practical extension staff training. Community

groups will get various services and consultation from FD through extension officers.

b) Contents of the Technology Transfer

1) FD officials

The important aspect of this project is not only to transfer technology of forestry but also to change FD official's perception of the farmers. The essence of community forestry is empowerment of the villagers. However, still many FD officers are not confident that farmers can manage forests by themselves. This idea or lack of confidence in the local community would be an obstacle to the project. Extension staff and their supervisors will learn necessity of empowering farmers and build up new relations with the local community through on-site-training in the selected villages. Besides the perception change, the extension staff will learn a series of relevant knowledge, such as how to identify the farmers needs (PRA method for example), how to assist farmers to organize and manage users' group, and how to handle forests. The last point may include establishment of seed stand for indigenous tree species, technology for suitable pot soil, and agro-forestry. The extension staff should be aware of the necessity of relevant technologies, for example, water supply, improved cooking stove, and food processing.

2) Farmers

The farmers will gain knowledge and techniques on organizing and administrating users' group, managing community forestry, and conducting agro-forestry, through extension activities of FD officials. This empowerment will change their conventional way of thinking. Farmers may become aware that the power of group works that improve their livelihoods.

(5) Impact on Economy

Even if the economic impacts of the farmers by this Project is not significant, the participants and their family of the users' groups can get stable benefit from the allocated forest. Community forest program will mitigate women's workload by improving access to the firewood. It will also improve household income through various farming and forest products as well as livestock. If carefully implemented, this project will benefit women and landless farmers and mitigate their poverty. In other words, this project may work on correcting income disparity by securing the civil minimum for the farmers. However, one thing to be noticed is time span. Forest products may be available on a significant scale some ten years after the planting of trees.

6.1.2 Impacts on Natural and Social Environment

Community forests contribute to water resources and soil conservation. These two factors are essential to increase crop production, and have preferable effects on the environment of the area. There is no negative influence to the natural and social environment by the activities concerned since the Project aims to improve the environment and increase farmer's income.

However there are possibilities that 1) users' groups are organized without thorough understanding and consensus of the participants, 2) poor villagers, such as landless farmers, are excluded from the groups, and 3) community forests enclose lands and displace other farmers. If such cases happen, they will cause a negative impact on the social environment since they will discourage empowerment and the initiatives of the local community. Though these problems are difficult to control by the project, counter measures against these issues should be implemented as part of the project to minimize the possibility of occurring such cases.

6.1.3 Contribution to the Overall Goal

The project purpose is defined as "All Townships in Dry Zone acquire practical capacity to promote participatory forest management based on CFI." And the overall goal is "Forest Department promotes Community Forest Instructions in Dry Zone so that participants with spontaneous motivation are able to enjoy benefits from the community forest." If the project purpose is fulfilled, it will significantly contribute to the achievement of the overall goal, if FD sustains its policy on CFI.

6.2 Effectiveness

6.2.1 Appropriateness of the Project Purpose

The project purpose is clearly stated and its indicators are carefully defined. They are mentioned in the attached PDM in Chapter 7.1. The project purpose is that "all FD Township Offices in Dry Zone acquire *practical* capacity to promote participatory forest management." This purpose focuses on institutional ability as well as individual ability of FD staff. Because, as is mentioned in Chapter 2.4.2, the most important issue of the community forestry extension is management of FD, which could not allocate sufficient manpower to this work. This Project expects not only implementation of training but also successful extension achievement in the selected villages.

6.2.2 Application of Japanese Technology

70% of the national territory of Japan is covered with forest. Japan has a long history in forestry and experience on how to plant trees, take care, and make use of them. So far, 10 million ha of man-made forests have been established in Japan and this is one of the biggest achievements of the forest sector in the world. Concerning the forestry technology overseas, Japan has abundant experience in forestry in arid areas through JICA, NGO's, and private companies. Some examples are;

- 1) The Social Forestry Extension Model Development Project for Semi-arid Areas in Kenya,
- 2) The Kilimanjaro Village Forestry Project in Tanzania, and
- 3) The Integrated Community Forestry Development Project in Senegal.

Participatory projects of the local residents often include poverty alleviation and income

generation as parts of their mission. Japan has been engaging in numerous international cooperation projects of this kind. An example concerning forestry is Community Development and Forest/Watershed Conservation Project in Nepal

6.3 Efficiency

6.3.1 Appropriate Project Input

Inputs expected for this project mentioned in PDM (ANNEX 7.1) are sufficient to implement the project activities and to achieve the project purpose. The main input is made for training activities including on-site one. The target area covers some 60 townships, where the Project will support community forestry extension. If the project accepts three trainees (two extension staff and one senior officer) from each FD township office, this makes 180 trainees. Considering the training capacity as well as the past achievement of the CFDTTC, this can be easily managed. On the other hand, the on-site training should be carefully arranged, as FD and CFDTTC has little experience in on-the-job-training.

The Project master plan proposes a CFDTTC sub-center in Dry Zone, because this project gives priority to practical on-site-training rather than to theoretical training. This sub-center will be the base of the instructors' team and also work as center for follow-up workshop of ex-trainees and villagers' training course. This sub-center is conveniently located in Mandalay division and will significantly contribute to the project implementation.

6.3.2 Cost Performance of the Project

This Project aims at afforestation in Dry Zone through human resource development, institution building, and community participation. Participatory forestry has a significant potential to reduce the cost of afforestation comparing with the conventional way of planting and taking care of the forest by the public sector. As only the minimum essential input is considered in the project design, cost performance is supposed to be high. Beside the afforestation, this project will deliver an integrated benefit to the society of Myanmar. However, this benefit can be hardly converted into cash value. For example, FD will learn how to operate this kind of project. The extension staff will know how to facilitate local population to cooperate for mutual benefits. The severe deforestation is recovered and environment will be improved. Well-preserved forest will create water resource area. One of the most important sub-products of this project will be that the villagers will learn how to organize themselves and take action to improve their livelihood.

6.4 Relevance

6.4.1 Eligibility of the Project as Public Task

Firewood and various products from forests are essential for daily life and income generation of the farmers in Dry Zone. This Project directly addresses Basic Human Needs of the local

inhabitants through facilitating their participation in the community forestry. The project will secure the civil minimum for the farmers. The project also contributes to the conservation of the natural environment, with which vast people receive benefit through the conservation of water resources and soil fertility. In these aspects, this Project is suitable to be implemented by public sector.

6.4.2 Relevance to the ODA policy

In the Plan of JICA Cooperation for Myanmar in 2002, the following are considered as issues of priority; 1) Economic Structural Adjustment, 2) Development of Agriculture, Livestock, and Fishery, 3) Improvement of Medical Health Care, 4) Improvement of Education, 5) Improvement of Basic Infrastructure, 6) Environmental Conservation and Drug Control. Concerning the regional issue, a) Dry Zone, and b) Northern Shan State are considered as priority areas.

The proposed project addresses 2) Development of Agriculture and Livestock, and 6) Environmental Conservation, as well as a) Dry Zone. FD has been cooperating with Japan on forestry training program since 1990. Besides the project type technical cooperation, a Grant Aid Project "Afforestation in Central Dry Zone" and a Study Project "Integrated Mangrove Management through Community Participation" are expected to start in the near future.

6.4.3 Correspondence of the project purpose to the needs of Myanmar

The project purpose is "All Townships in Dry Zone acquire practical capacity to promote participatory forest management based on CFI." The Government of Myanmar firstly used the words "participation of people" in its Forest Policy in 1995. Also, CFI issued in 1995 clearly puts importance on the active participation of the local population. The very objective of the Project is to implement the concept of this CFI. A request document to JICA "Terms of reference for project technical cooperation" issued by FD in August 1999 mentioned that one of the immediate objectives of the Project is to create improved income generation opportunities for the rural communities down to the grassroots level through community-based forest plantations. In these aspects, the project purpose meets the needs of the authorities as well as people in Dry Zone.

6.4.4 Participatory Planning of the Project

The PCM workshop was held to make a basic plan of the Project on 21st December 2000 with 20 participants from FD headquarters, CFDTC, DZGD, Ministry of Agriculture and Irrigation, and JICA. Poverty was clarified as a major issue of Dry Zone, and how to mitigate poverty was the main topic of the PCM workshop. Beside the workshop, JICA Study Team interviewed residents at some villages and try to identify their needs. The Team also had a series of meetings with frontline officers of FD and DZGD including those who are in charge of extension works. All the information collected on site has been considered in the planning stage of the project. Thus, the Project plan is formulated based on participatory discussions.

6.4.5 Establishment of Project Operation and Management System

Both Japanese and Myanmar sides agreed upon the basic idea of the project operation and management system illustrated in Figure 5.2. Both sides are in agreement about the functions and members of the committee as are mentioned in ANNEX 7.8.

6.4.6 Establishment of Evaluation and Monitoring System

Indicators for evaluation and monitoring are clearly defined by figures and by time and mentioned in the PDM. Sampling surveys may be needed to obtain some figures as indicators. These evaluation and monitoring surveys will be undertaken as activities of the project. Director of Training and Research Development Division is responsible for these survey operation. Joint evaluation by the two Governments will be conducted at the midpoint and during the last six months of the Project term.

6.5 Sustainability

6.5.1 Institutional Ability

CFDTC, one of the main counterpart agencies of this Project, has the administrative ability to implement the prospective training courses. During 10 years of cooperation with JICA, its capability has been improved and proven to be adequate. As for FD, it is the most appropriate counterpart agency for this Project, as extension of community forestry is one of its responsibilities and it has a branch office in each township in Dry Zone. Institutional ability of FD and its branch offices seem sufficient for the conventional works. However, for community forestry extension, their capability is very limited. Enhancement of FD and its branch offices in terms of the CFI extension work is the purpose of the Project. And the sustainability is assured when the project purpose is achieved.

6.5.2 Financial condition of FD

Extension and support of community forest are social development activities, which do not need large financial resources. However, budget allocations to CFDTC and Township Offices are very limited, and there is no additional budget guaranteed specifically for community forestry extension. FD may need some effort to cover the costs for implementation of the training courses, on-site extension activities and necessary supporting measures. As forest conservation in Dry Zone is a policy with high priority and FD well understands the importance of the continuous effort after the Project termination, FD shall make long-lasting effort to allocate necessary budget.

6.5.3 Social, Environmental, and Technical Acceptability

The Project consists of two phases, i.e. training of extension officers and practical extension work through on-site training. Training is a very common activity of FD. CFDTC and staff of frontline offices have a long experience in implementing training courses. However, empowerment of village people in terms of community forest management is a very new aspect of the extension work. The extension work will play a key role in the Project.

Empowerment through technology transfer to village people requires two conditions; 1) Sufficient training for extension staff and development of a supporting system for them, and 2) Establishing confidence and good relationships between FD officers and local communities. Promoting a real participatory culture in the forest administration is a very challenging task.

6.6 Overall Project Justification

Judging from the above analysis with five criteria, namely 1) impact, 2) effectiveness, 3) efficiency, 4) relevance, 5) sustainability, the Project can be justified in being implemented as an international project. Overall project justification is summarized in Table 6.1.

Table 6.1 Overall Project Justifications

No	Criteria	Evaluation result	Remarks
1	Impact	Moderate	<p>a) The Project will have positive impacts on policy and institutional framework, as participatory forest management is an epoch making system in FD.</p> <p>b) Socio-economic impact depends on size of beneficiaries. The Project should formulate very good model cases in the selected villages, which have demonstrating effects and influence the neighboring areas; otherwise the number of direct beneficiaries remains just 600 households.</p> <p>c) The project could cause negative social impacts if 1) community forest groups are formulated without consensus of the participants, 2) poor villagers are excluded from the program, and 3) community forests cause conflicts with the vested interests of other farmers.</p> <p>d) There will be positive impacts on the natural environment such as water resource and soil conservation.</p>
2	Effectiveness	high	Project purpose is appropriate and can be achieved.
3	Efficiency	Moderate	Inputs directly bear the output, if the extension staff get appropriate knowledge and skill. Cost performance could be low if the number of community forest groups is smaller than expected.
4	Relevance	High	The Project well accords with concerning policies and needs of the local communities.
5	Sustainability	Moderate	With necessary institution building as part of the project activities, project sustainability would be improved. However, sustainability can be influenced by various factors such as FD's policy on CFI, mobilization of staff, budget allocation for operation, and so on.

7. ANNEX

7.1 Project Design Matrix (PDM)

Project Name: Community Forestry Training and Extension Project in Dry Zone in the Union of Myanmar
 Target Group: Extension staffs, local residents
 Target Area : Dry Zone
 Period: 2001-2006
 Date Prepared: 25 Oct. 2001

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal Forest Department (FD) promotes participatory forest management in Dry Zone based on the Community Forestry Instructions (CFI) so that people with spontaneous participation are able to enjoy benefit from the Community Forests.</p>	<p>1) 80% of Community Forests established during the project period continue to be managed by users' groups. (As of 2011) 2) New Community Forests continue to be established in more than 50% of Townships in Dry Zone after the termination of the Project. (As of 2011) 3) Forest Products are utilized by at least 10 users' groups which are initiated by the project (As of 2011)</p>	<p>- Inventory of Community Forest</p>	<p>-FD does not negatively change CFI policy on community forestry.</p>
<p>Project purpose All FD Township Offices in Dry Zone acquire practical capacity to promote participatory forest management based on the CFI.</p>	<p>1) Community Forests are established in more than 50% of townships in Dry Zone. 2) Spontaneous participation in users' group is secured in the process of establishment of community forestry. 3) 90% of the ex-trainees are still active in CFI extension work 1 year after the training at CFDTIC.</p>	<p>1) Inventory of community forest 2) Sampling survey 3) Sampling survey</p>	<p>-Drought, fire, harmful insects, and disease do not cause significant damage to forest. -Instructions for CFI extension are continuously issued to the extension staff.</p>
<p>Outputs (1) An extension plan for promotion of participatory forest management in Dry Zone based on the CFI is prepared. (2) Extension staff understand the importance of participatory forestry management and acquire necessary skill and knowledge for extension through training. (3) Extension of participatory forest management is practiced in villages in Dry Zone as a part of extension staff training.</p>	<p>1) An extension plan is authorized by the Forestry Department. (By the end of second year) 2-1) Adequate numbers of qualified trainers are assigned. 2-2) All trainees pass the achievement test at the end of training course at CFDTIC 2-3) CFI Extension manual is prepared 3-1) CFI manuals for villagers are prepared 3-2) 80 percent of trainees are engaged in extension practice (6 months after each training course at CFDTIC)</p>	<p>1-1) Official letter from FD Director General 2-1) Record of assignment, and evaluation survey 2-2) Test record 2-3) Official letter from Project Director 3-1) Official letter from Project Director 3-2) Evaluation survey by the project</p>	<p>-Conflict over land use does not occur because of establishment of the Community Forest.</p>

<p>Activities of the Project</p> <p>1-1) To study the current extension system 1-2) To identify appropriate extension procedures and methods 1-3) To work out a desirable institutional set-up for extension 1-4) To identify geographical priority areas for extension 1-5) To identify required skills and qualification of extension staff 1-6) To formulate a training plan.</p> <p>2-1) To train trainers, lecturers, and instructors 2-2) To formulate training curriculum 2-3) To develop training materials including extension manual 2-4) To conduct training courses for the following categories of personnel - Extension staff at FD Township Offices - Managers / supervisors of extension staff 2-5) To conduct evaluation of training courses</p> <p>3-1) To prepare manuals for villagers on CFI 3-2) To instruct and assist extension staff who are engaged in extension practices at following stages -Preparation of action plan for extension practices -Identification of possible target villagers -Explanation on CFI to villagers and inquiry of their willingness to establish Community Forests -Provision of assistance to villagers in identifying appropriate site for Community Forests -Provision of assistance to villagers in organizing users' groups -Provision of assistance to villagers in applying for Community Forest establishment -Provision of seed and Seedling to villagers -Technical guidance in the field to villagers 3-3) To conduct follow-up training for extension staff 3-4) To conduct seminars for villagers on CFI and necessary forestry technique 3-5) To conduct evaluation of extension practices 3-6) To conduct evaluation of performance of users' groups and their community forest. 3-7) To review the extension plan based on the experiences of extension practices</p>	<p>Inputs</p> <p>(1) Inputs from Myanmar side [Project personnel that including counterpart personnel] 1) Project Director: Director, Forest Department (FD) 2) Deputy Project Director: Director, Training and Research Dev, Div, FD 3) Counterpart and administrative personnel from the following offices; - Training and Research Development Division, FD - CFDTC - CFDTC Sub-center</p> <p>[Trainees] 1) Extension Staff 2) Supervisors of extension staff</p> <p>[Land and facilities] 1) Land for CFDTC and CFDTC sub-center 2) Buildings and facilities for training and administration</p> <p>[Project operation budget] 1) Budget for training implementation 2) Budget for field extension practices, including travel allowances for extension practices as on-the-job Training</p> <p>(2) Inputs from Japanese side [Long term experts] 1) Chief advisor 2) Project coordinator 3) Long-term experts in the following technical fields; Extension Planning, Training and, Community Forestry Extension</p> <p>[Short term experts] Short term experts may be dispatched when necessary, [Counterpart training in Japan] 2-3 counterpart personnel per year will be sent to Japan for training</p> <p>[Equipment] 1) Equipment for training and field extension 2) Vehicles 3) Other necessary equipment for the implementation of the Project</p> <p>[Infrastructure] Construction of the CFDTC sub-center</p> <p>[Training Expenditure] A part of expenditures for the training of extension staff, supervisors, and villagers</p>	<p>Ex-trainees are appropriately assigned to the posts for CFI extension</p>
		<p>Preconditions</p> <p>-Clear instructions for CFI extension are issued to the extension staff.</p>

7.2 Plan of Operations (tentative)

Activities	Expected results	Schedule					Person in charge	Implementer	Equipment	Cost
		2002	2003	2004	2005	2006				
1-1) Study the current extension system	Extension Plan for Participatory forest management in Dry Zone	█					(For 1-3)) Director of Training and research, FD	Each CFDTTC staff	vehicles computers & printers digital cameras digital projector and copy machine	transportation and allowances of necessary survey trip
1-2) Identify appropriate extension procedures and methods		█								
1-3) Work out a desirable institutional set-up for extension		█								
1-4) Identify geographical priority areas for extension		█								
1-5) Identify required skills and qualification of extension staff to formulate a training plan.		█								
2-1) Train trainers, lecturers, and instructors	Trained extension staff with necessary skill and knowledge	█	█	█	█	█	Principal of CFDTTC	vehicles & mini-bus computers & printers digital cameras digital projector and copy machine	transportation and allowances for trainees, Printing manuals and texts	
2-2) Formulate training curriculum		█	█	█	█	█				
2-3) Develop training materials including extension manual		█	█	█	█	█				
2-4) Conduct training courses for extension staff and their supervisors		█	█	█	█	█				
2-5) Conduct evaluation of training courses		█	█	█	█	█				
3-1) Prepare manuals for villagers on CFI	Extension of participatory forest management in villages in Dry Zone	█					Director of Training and research, FD & CFDTTC principal	vehicles & mini-bus computers & printers digital cameras digital projector and copy machine	transportation and allowances for trainees and evaluation officers, Printing manuals and texts	
3-2) Instruct and assist extension staff who are engaged in extension practices at various stages		█	█	█	█	█				
3-3) Conduct follow-up training for extension staff		█	█	█	█	█				
3-4) Conduct seminars for villagers on CFI and necessary forestry technique		█	█	█	█	█				
3-5) Conduct evaluation of extension practices		█	█	█	█	█				
3-6) Conduct evaluation of performance of users' groups and their community forest.		█	█	█	█	█				
3-7) Review the extension plan based on the experiences of extension practices		█	█	█	█	█				

7.3 TOR of Long-term Experts

(1) Chief Advisor

1	Position	
1)	Post	Chief advisor
2)	Office	FD headquarters and CFDTC
3)	Required qualification	15 years+ experience in forestry administration English fluency of working level
2	Counterpart personnel	
1)	Director General, FD	
2)	Director of training Dept.	
3	Expected activities	
1)	Location of the activities	Yangon, Hmawbi(CFDTC)
2)	Term of activities	From Dec. 2001 for five years, 60 man/month
3)	Responsible activities	To provide necessary recommendations and advice to the Project Director and the Deputy Project Director on any matters pertaining to the implementation of the project

(2) Project Coordinator

1	Position	
1)	Post	Project coordinator
2)	Office	CFDTC
3)	Required qualification	5 years+ experience in international cooperation Excellent English fluency
2	Counterpart personnel	
1)	Principal CFDTC	
2)	Director of training Dept.	
3	Expected activities	
1)	Location of the activities	Yangon, Hmawbi(CFDTC)
2)	Term of activities	From Dec. 2001 for five years, 60 man/month
3)	Responsible activities	To manage Project administration and coordination among concerned parties of the project

(3) Expert on Extension Planning

1	Position	
1)	Post	Long term expert
2)	Office	CFDTC
3)	Required qualification	10 years+ experience in relevant field English fluency of working level
2	Counterpart personnel	
1)	Trainer(s) of CFDTC	
2)		
3	Expected activities	
1)	Location of the activities	Hmawbi(CFDTC)
2)	Term of activities	From Dec. 2001 for one year, 12 man/month
3)	Responsible activities	To make necessary advice and guidance for the formulation of the extension plan to the Myanmar side

(4) Expert on Training

1	Position	
1)	Post	Long term expert
2)	Office	CFDTC
3)	Required qualification	10 years+ experience in training English fluency of working level
2	Counterpart personnel	
1)		
2)		
3	Expected activities	
1)	Location of the activities	Hmawbi(CFDTC)
2)	Term of activities	From Dec. 2001 for five years, 60 man/month
3)	Responsible activities	To make necessary advice and guidance concerning the training of community forestry extension in selected villages.

(5) Expert on Community Forestry Extension

1	Position	
1)	Post	Expert on Community Forestry Extension
2)	Office	CFDTC sub-center
3)	Required qualification	10 years+ experience in community forestry English fluency of working level
2	Counterpart personnel	
1)	Trainers of CFDTC sub-center	
2)	Instructors' team members	
3	Expected activities	
1)	Location of the activities	CFDTC sub-center and Townships in Dry Zone
2)	Term of activities	From Dec. 2001 for five years, 60 man/month
3)	Responsible activities	To make necessary advice and guidance concerning the extension of community forest in selected villages

7.4 TOR of Counterparts

(1) Director General of FD

1	Position of C/P	
1)	Post	Director General of FD
2)	Office	FD head office
3)	Required qualification	Sufficient experience in forestry administration English fluency of working level
2	Expected activities	
1)	Location of the activities	FD head office
2)	Responsible activities	To manage overall implementation of the project in cooperation with the Japanese Chief Advisor

(2) Director, Training and Research Development Division, FD

1	Position of C/P	
1)	Post	Director, Training and Research Development Division
2)	Office	FD head office
3)	Required qualification	Sufficient experience in training and research English fluency of working level
2	Expected activities	
1)	Location of the activities	FD head office
2)	Responsible activities	-To manage implementation of the extension planning, training, and evaluation in cooperation with the Japanese Chief Advisor and Project Coordinator

(3) Staff of Training and Research Development Division, FD

1	Position of C/P	
1)	Post	Staff of Training and Research Development Division, FD
2)	Office	FD head office
3)	Required qualification	Sufficient experience in training and research administration English fluency of working level
2	Expected activities	
1)	Location of the activities	FD head office
2)	Responsible activities	-To study the current extension system -To identify appropriate extension procedures and methods -To work out a desirable institutional set-up for extension -To identify geographical priority areas for extension -To identify required skills and qualification of extension staff -To formulate a training plan. -To conduct evaluation of training courses -To conduct evaluation of extension practices -To conduct evaluation of performance of users' groups and their community forest. -To review the extension plan based on the experiences of extension practices

(4) Staff of CFDTC

1	Position of C/P	
1)	Post	Principal and Training Instructors
2)	Office	CFDTC
3)	Required qualification	-Sufficient experience in relevant administration or technical fields -English fluency of working level
2	Expected activities	
1)	Location of the activities	CFDTC
2)	Responsible activities	-To join instructors' training -To formulate training curriculum -To develop training materials including extension manual -To conduct training courses for the following categories of personnel a) Extension staff at FD Township Offices b) Managers / supervisors of extension staff

(5) Manager and Staff of CFDTC Sub-center

1	Position of C/P	
1)	Post	Manager and Staff of CFDTC Sub-center
2)	Office	CFDTC Sub-center
3)	Required qualification	Sufficient experience in community forestry extension English fluency of working level
2	Expected activities	
1)	Location of the activities	CFDTC Sub-center and Villages in Dry Zone
2)	Responsible activities	-To prepare manuals for villagers on CFI -To instruct and assist extension staff who are engaged in extension practices -To conduct follow-up training for extension staff -To conduct seminars for villagers on CFI and necessary forestry technique

7.5 Specification of Equipment

The following Table 7.5.1 shows the equipment which will be provided from Japanese side. Other necessary equipment will be considered.

Table 7.5.1 Equipment

No	Equipment	Location	Unit	Specification
1	Vehicles	Sub-Centre	1	Pick-up 4wd
			2	4wd for 5 passengers
2	Mini bus	Sub-Centre	1	For 25 passengers
3	Computer	CFDTC	5	PC with Windows2000 and MS Office
		Sub-center	3	PC with Windows2000 and MS Office
4	Printer	CFDTC	2	One B&W laser, One color inkjet
		Sub-center	1	B&W inkjet
5	Digital camera	CFDTC	1	Zoom lenz, 2 mil. Pixels, 64 Mb. memory
		Sub-center	2	Zoom lenz, 2 mil. Pixels, 64 Mb. memory
6	Digital projector and screen	CFDTC	1	Handy type
		Sub-center	1	Handy type
7	Copy machine	CFDTC	2	A4 and A3 size
		Sub-center	2	A4 and A3 size
8	Facsimile	Sub-center	1	A4 size

7.6 Commitment from Counterpart Agency

FD committed on the following issues;

(1) Achievement of overall goal

FD will continue its effort on extending community forest, even after the Project terminates in 2006.

(2) Secured assignment of qualified counterpart personnel

FD will make maximum effort to keep the counterpart personnel of the Project in appropriate position so that the transferred technology is continuously disseminated in Myanmar.

(3) Budget allocation

Budget for community forestry extension activities will be secured with significant priority.

(4) Enforcement of the community forest

FD will not force people to formulate community forest groups or participate them.

(5) Institution building

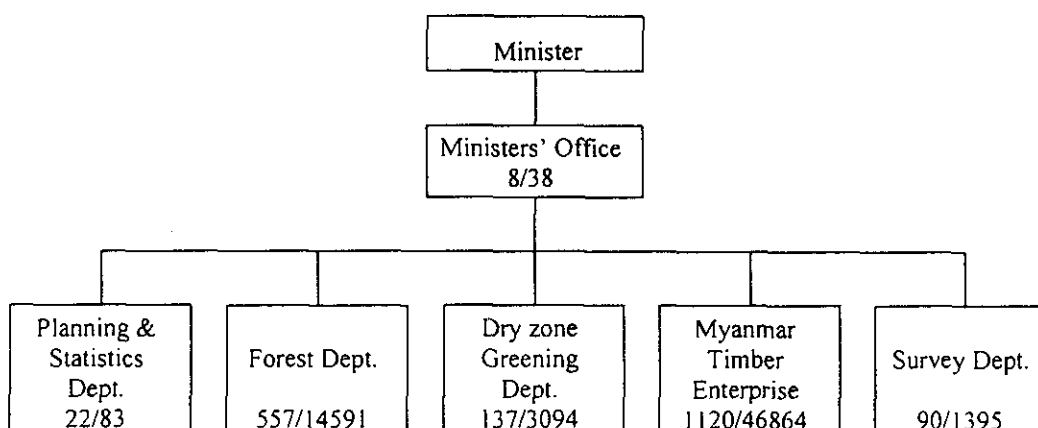
FD will not negatively change CFI policy on community forestry. Instead, it will make an effort to enact Forestry Rules which has a higher legal status than CFI.

7.7 Information on the Relevant or Counterpart Organizations

7.7.1 Ministry of Forestry

The organization of the Ministry of Forestry comprises one minister's office, for departments and an enterprise. The Planning and Statistics Department is formally a head department, but in the field of forest and forestry, FD is the main administrative body. Figure 7.7.1 shows the structure of Ministry of Forestry.

Figure 7.7.1 Organization of Ministry of Forestry



Note: (A/B) Left number in box shows Officer Class
Right number in box shows Staff Class

The budget of the Ministry of Forestry is shown in the Table 7.7.1. The biggest allocation is for Myanmar Timber Enterprise (MTE), which is mainly due to the harvesting work of Teak and other hard woods.

Table 7.7.1 Budget allocation of Ministry of Forestry for 2000/1 Fiscal Year

Serial No.	Particulars	Amount (in million kyats)
1	Minister's Office	13.522
2	Forest Department (FD)	1,938.671
3	Planning And Statistics Department	15.475
4	Survey Department	118.924
5	DZGD	505.013
6	Myanmar Timber Enterprise	15,829.730
	Total	18,421.335

SOURCE: Answering Paper submitted by FD, December 2000

Table 7.7.2 shows the number of staff in the Ministry. There is a difference between the number of personnel prescribed and those actually designated. This phenomenon is commonly observed in the forestry administration.

Table 7.7.2 Number of Staff in the Ministry of Forestry

No	Particulars	Officers		Staff		Total	
		Prescribed	Designated	Prescribed	Designated	Prescribed	Designated
1	Minister's Office	8	5	38	39	46	44
2	Planning and Statistics Dep.	22	16	83	88	105	104
3	Forest Dep.	557	464	14591	10680	15148	11144
4	Dry Zone Greening Dep.	137	102	3094	1461	3231	1563
5	Myanmar-Timber Enterprise	1120	845	46869	34606	47989	35451
6	Survey Department	90	68	1395	833	1485	901
	Total	1934	1500	66070	47707	68004	49207

SOURCE: Answering Paper submitted by FD. December 2000

7.7.2 Forest Department (FD)

The overall counterpart organization of this Project is Forest Department (FD). The organization chart of FD is shown in Figure 7.7.2, and progress of its staff numbers is listed in Table 7.7.3. The implementing agency of the proposed Project shall be Training and Research Development Division of FD.

Table 7.7.3 Change of the Number of Staff in FD

Year	1991	1992	1993	1994	1995	1996	1997	1998
Officer Class	6,799	6,848	6,867	7,188	7,161	7,681	7,815	7,314
Asst. Class	1,802	1,824	1,813	1,892	1,420	1,661	3,305	1,888
Total	8,601	8,672	8,680	9,080	8,581	9,342	11,120	9,202

SOURCE: Brochure written by Japanese Experts. December 2000

Table 7.7.4 shows the number of FD staff in the three territorial divisions of Dry Zone. Total number of prescribed staff is 1,429, while designated staff is 1,720. Satisfaction rate is 83.1%. On the other hand, FD's total staff satisfaction rate is 73.6% (11,144/15,148 from the Table 7.7.2). This comparison tells that Dry Zone has more priority than the other area in the forestry administration.

Table 7.7.4 Prescribed and Designated number of FD staff in Dry Zone

Territorial Division	Staff Officers		Range Officers		Forest Rangers		Foresters		Forest Guards	
	Designated	Pre-scribed	Designated	Pre-scribed	Designated	Pre-scribed	Designated	Pre-scribed	Designated	Pre-scribed
Sagaing (17 townships)	9	9	31	33	114	113	218	228	49	60
Mandalay (16 townships)	13	10	38	40	120	131	194	264	77	72
Magway (24 townships)	15	17	46	57	164	201	291	397	50	88
Total	37	36	115	130	398	445	703	889	176	220

SOURCE: Forest Department, August 2001

The budget of the Forest Department (FD) is shown in Table 7.7.5, where the capital budget

means the budget for fixed assets like construction, machinery, equipment etc. and the current one for salary, traveling allowance, labor charge, machinery maintenance, transportation, office equipment etc.

At first sight, the budget appears to have increased year by year. But CPI (Consumer Price Index) indicates the number of 1,561 in the year 1999 and 100 in the year 1987.¹ So, it can be said that the budget has not increased substantially. In this regard, salaries of the staff were raised a few years ago in order to avoid substantial decline of the living standards of FD staff,

The Forest Department appears to make efforts to acquire funding resources for the budget through determination of real forest value inclusive of intangible function of forests and its documentation, cost-sharing with other sectors benefiting from forests like irrigation, agriculture, tourism etc. and procurement of development fund from international or private donors.

Table 7.7.4 Expenditure of FD (Kyat in million)

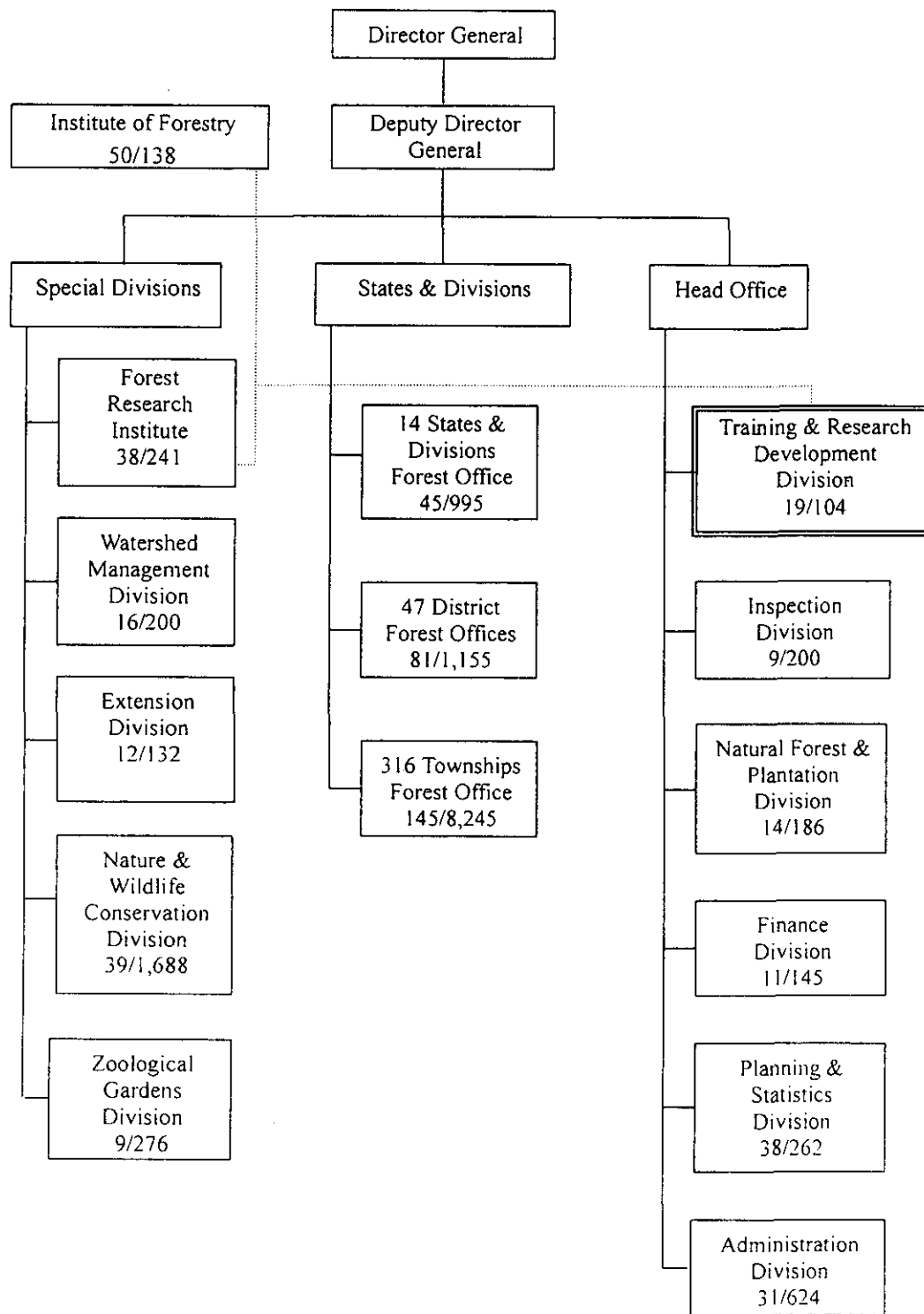
Year	Expenditure		
	Capital	Current	Total
1987-88	123.69	107.53	231.22
1988-89	117.10	119.57	236.67
1989-90	158.86	197.83	356.69
1990-91	89.46	253.55	343.01
1991-92	95.87	230.92	326.79
1992-93	115.98	246.87	362.85
1993-94	122.11	289.95	412.06
1994-95	144.34	300.90	445.25
1995-96	244.46	307.16	551.62
1996-97	354.85	347.14	701.99
1997-98	377.30	402.66	779.96
1998-99			828.30

SOURCE: "SALIENT FORESTRY FACTS AND FIGURES"FD, November 1998

Concerning the budget disbursement, the Budget Division of FD keeps accounts and is the main disbursing officer for the Divisions at Headquarters. The territorial States/Division offices have their own bank accounts to which Head Office transfers funds through Letters of Credit. The District Offices also have their bank accounts to which Head Office transfers funds with the approval of the Division Office concerned. The system is the same with the Township Offices. How funds are disbursed has to be reported to the District Office, and how funds are disbursed within the Districts has to be reported to the Division Office concerned in monthly accounts. Institutions like Forest Research Institute, Institute of Forestry, CFDT, and Myanmar Forest School also have their own bank accounts.

¹ Key Indicators of Developing Asian and Pacific Countries, Asian Development Bank, 2001

Figure 7.7.2 Organization Chart of FD



NOTE: Number at Left shows Officer Class,
Number at right shows Staff Class

SOURCE: Answering Paper by FD, December 2000

The comprehensive roles of FD are described in article 9 of Forest Law, where eight functions

Figure 7.7.3 Organization Chart showing Position of TRDD

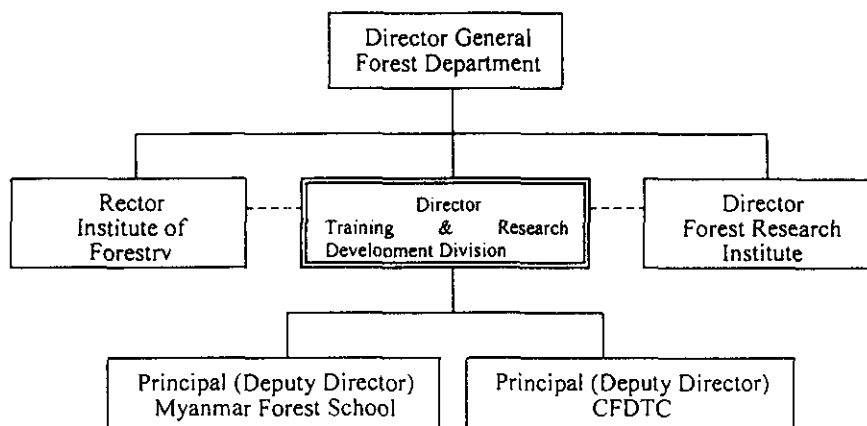


Table 7.7.6 indicate the number of staff in TRDD.

Table 7.7.6 Prescribed and Designated number of TRDD Staff

Forest Staff			Clerical Staff		
Position	Designated	Prescribed	Position	Designated	Prescribed
Director	1	1	Head Clerk	1	1
Deputy Director	-	-	Branch Clerk	2	2
Assistant Director	1	1			Domestic matters (1) Overseas matters (1)
Staff Officer	1	1	Upper Division Clerk	3	3
Range Officer	-	2			Domestic (1), Overseas (2)
Forest Rangers	-	-	Lower Division Clerk	6	7
Foresters	-	4			Domestic (2), Overseas (1),
Forest Guards	-	-	Driver	1	3
Other class	13	21			Transportation
Total	16	30	Others	0	5
			Total	13	21

SOURCE: Forest Department, August 2001

Note: The above figures do not include staff of Myanmar Forest School and CFDTC

As to the difference between CFDTC, IOF and MFS, CFDTC is a training organization that has been mainly utilized as a place for in-service training on their official duties and technological improvements and public training on raising public awareness and practicing techniques for local people over a comparatively short period. Sometimes it is a place for training sponsored by other agencies, such as international organizations etc. On the other hand, IOF and MFS, aim at not only the staff of FD, but also the staff of other departments like Myanmar Timber Enterprise, that are regarded as educational and academic organizations.

Forest Extension Division (FED) of FD works for public relations of all FD divisions. It deals with magazines to introduce FD activities and to highlight the importance of forest to the public.

FED also issues newsletters for the better understandings of its actions for the staff of FD and relevant organizations. As budget and staff are very limited, FED might not be in the position to directly handle the community forestry extension of the front line in the near future. However, FED can back-up the promotion of community forestry through its publication works.

7.7.3 Central Forestry Developing Training Center (CFDTC)

The training courses in CFDTC intended for the staff of FD are largely divided into two categories, one is designed for learning techniques and knowledge necessary at present or in the future, such as the courses "Plantation Techniques" and "Nursery Practices" which had been conducted as part of Technical Cooperation Program (TCP) from 1990 to 1995. The other is designed for promotion steps of forest staff such as "Forest Officer Course-Advanced" and "Forest Induction Course," which as a matter of course cannot be designated as the courses of TCP. The training courses for promotion would in themselves have incentive to trainees, but the ones for extension, which will be improved or newly established in the proposed Project, seem not to have a direct relation to promotion, just as previous TCP training courses had non-incentives to trainees from the viewpoint of promotion. Extension works are also activities with educational methods, which would be influenced to some extent by individual character.

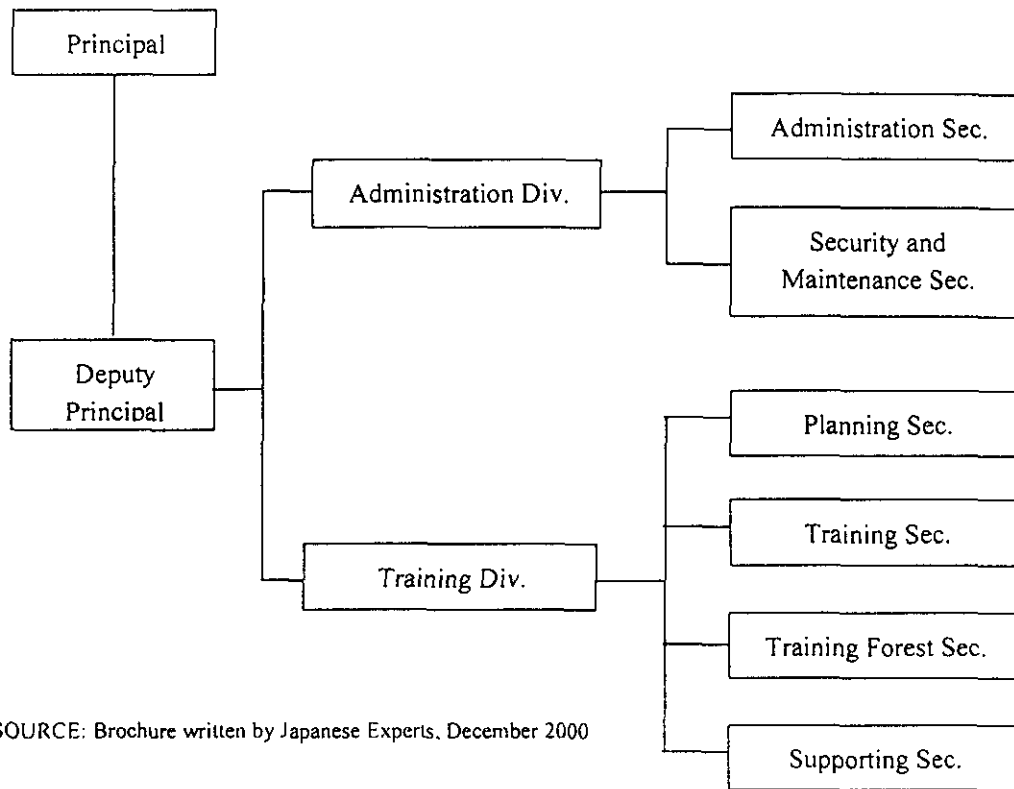
As stated above, therefore, for the management of training, the incentives like providing extension allowance through establishing extension system in the future and the selection of trainees with suitable character for extension work, should be taken into consideration in a positive light. The progress of its staff number is listed in Table 7.7.5 and organization chart of CFDTC is shown in Figure 7.7.3.

Table 7.7.5 Change of the Number of CFDTC Staff

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Director	1	1	1	1	1	1	1	1	0	0
Dy Director							1	1	1	1
Asst Director	2	2	2	2	1	1			1	1
Staff Officer	7	5	7	9	9	10	9	10	11	10
Range Officer	14	13	14	11	14	12	10	10	5	4
Total	24	21	24	23	25	24	21	22	18	16

SOURCE: Brochure written by Japanese Experts, December 2000

Figure 7.7.3 Organization of CFDTC



SOURCE: Brochure written by Japanese Experts, December 2000

The budget of CFDTC from the beginning of the Project Type Technical Cooperation, 1990 to 1999, is shown in Table 7.7.6.. The budget comes mainly from the current budget of the Forest Department mentioned above.

A nominal increase in the budget can be seen, but taking into account the increase of CPI as mentioned before and the augmentation of the training courses, the situation of the budget would be severe in general, resulting in the lack of expenditure in some cases. But once the Project starts, the minimum but necessary cost of the Project will be secured especially as far as TCP (Technical Cooperation Project) is concerned, from the past experience of CFDTC Project. And there seem to be some cases where the work prescribed in operating units cannot be implemented in spite of being earmarked in the budget. So it would be necessary to ensure timely disbursement to the units in the future.

From 1995 to 1998, the Special Training Fund for CFDTC and TCP (Technical Cooperation Project) was appropriated. Those budgets, in accordance with the decrease of the Japanese fund with the termination of CFDTC Project in 1995, had been established for the subsequent implementation of the training courses in CFDTC. The budgets are said to come from the Retention Fund of Director General, FD. And they seem to be incorporated into the main budget of CFDTC after 1999.

Table 7.7.6 The Budget for CFDTC

Fiscal Year	CFDTC Current Account	Construction	Machinery & Equipment	Special Training Fund for CFDTC	Special Training Fund for TCP	Total
1990	607,620					607,620
1991	2,193,900	479,900	120,000			2,793,800
1992	2,214,000	750,000	80,600			3,044,600
1993	3,564,300	750,000	50,000			4,364,300
1994	4,000,000	900,000	90,000			4,990,000
1995	4,217,510			194,600	305,200	4,717,310
1996	4,208,480			135,240	289,490	4,633,210
1997	4,426,243			355,250	98,000	4,879,493
1998	7,052,204			594,449		7,646,653
1999	6,195,720					6,195,720

Source: Brochure written by Japanese Experts, December 2000

Note) CFDTC Current Account includes Labor charge, Fuel, Machinery maintenance, Electrical charge Material purchasing etc. (here excluding salary and traveling allowance of the staff in FD)

The expenditure for the training courses to be implemented in the CFDTC Sub-Center, which will be established in the proposed Project, is considered to be included within the CFDTC budget. However, the expenditure necessary for on-site training after the completion of training courses, viz. field extension works in the trainees' mother units for establishing community forests, can not be found at present in the budget at District Forest Office or Township Forest Office level. So, the budget matters relating to field extension works, including pros and cons and management position, will become the issues to be solved in the future. The following Table 7.7.7 shows the proposed number of staff at the CFDTC sub-center.

Table 7.7.7 Proposed Number of Staff at Dry Zone Sub Center

No	Position	Number	Office
1	Project Director	1	Dry Zone
2	Assistant Director	1	Dry Zone
3	Counterparts in specialized fields	8	Dry Zone
	Total	10	

SOURCE: Requesting Paper of CFDTC Phase 2 Project, 10 September, 1999

7.7.4 FD Division Office

Dry Zone extends into three divisions, and FD has offices in each division. For the first stage of the project, the priority of community forestry extension shall be given to the townships in the Mandalay division. Mandalay is the economic and administrative center of Dry Zone. The budget of Mandalay Division Forest Office is shown in the Table 3.5 and 3.6.

As mentioned in Table 7.7.8, there is an amount in the budget for the establishment of local supply forest which can be transferred to villages in the future, although any budget for extension works cannot be found.

Table 7.7.8 Budget of Mandalay Division Forest Office (2000/2001) –Plantation–

No.	Type of Plantation	Function		Allowed Money	Remarks
		Acre (Ha)	Rate in Kyats		
1	Special Teak	3,000 (1215)	3,290	9,870,000	
2	Ordinary Teak	1,000 (405)	1,815	1,815,000	
3	Industrial Raw Material	500 (203)	1,660	830,000	
4	Firewood for Village Use	400 (162)	955	382,000	
5	Water Supply (Special)	4,100 (1661)	985	4,038,500	
6	Water Supply (Zi Taw Den)	50 (20)	2,940	147,000	
7	Public Supply (The Whole Districts)	19.5 (8)	0.55	1,072,500	
8	Public Supply (Ngar Zon)	0.2 (0.1)	0.55	11,000	
9	Public Supply (Pyin Oo Lwin)	2.9 (1.2)	1.40	406,000	
10	Water Supply			1,008,000	
11	Special Teak (Weeding)	2,950 (1195)	350	1,032,500	

SOURCE: Mandalay Division Forest Office, December 2000

Table 7.7.9 Budget of Mandalay Division Forest Office (2000/2001) –Conservation

No	Type of Particulars and Rate	Budget (Kyats)	Title
1	Selection Supplementary Marking	91,440	02
	50,799seedlings×9.30kyat 472,430kyats	355,590	03
		25,400	04
2	Natural Regeneration 5,800acre×400ks	2,320,000	03
3	Thinning 3,000acre×300ks	900,000	03
4	Repairing of F. Road 545miles×400ks	218,000	04
5	Boundary Repairing 390miles×2,500ks	975,000	04
6	Fire Prevention	1,847,250	
	Project Area 42,230acres 2,463,000kyats		
	Supply (%) 75% Money Supply 1847250 ks		
7	Weeding	5,099,250	
	Project Area 25,560acres 6,799,000kyats		
	Supply 75% Money Supply 5,099,250kyats		
8	Fire Prevention (Adding the last Balance 25%)	615,750	03
9	Weeding (Adding the last Balance 25%)	1,699,750	03
10	Thinning (Adding the last Balance 25acre*3000ks	7,500	03

SOURCE: Mandalay Division Forest Office, December 2000

Indeed, there is no CFI extension staff in the division. But it is said that high or middle class officers in the divisions, the districts and/or the townships forest offices such as deputy directors, assistant directors, staff officers etc., are responsible for CFI extension works although there are no specific personnel engaged in extension works.

7.7.5 Township Forest Office

FD Township Offices are frontline agencies of the forest administration. Each of the 57 Townships in Dry Zone has this office. The following is an example of a FD Township Office in

Patheingyi Township in Mandalay District. The office has 46 members (1 Staff Officer, 3 Range Officers, 11 Deputy Range Officers, 3 Forest Guards, and others). This Township has 134 villages. The office has three base camps where the 11 Deputy Range Officers are working on forest conservation and maintenance, planting along major roads, selling seedlings, and so on. For the extension work, staff are engaged in planting ceremony and promotion of firewood substitutes (coal briquette). Extension of community forest is not carried out.

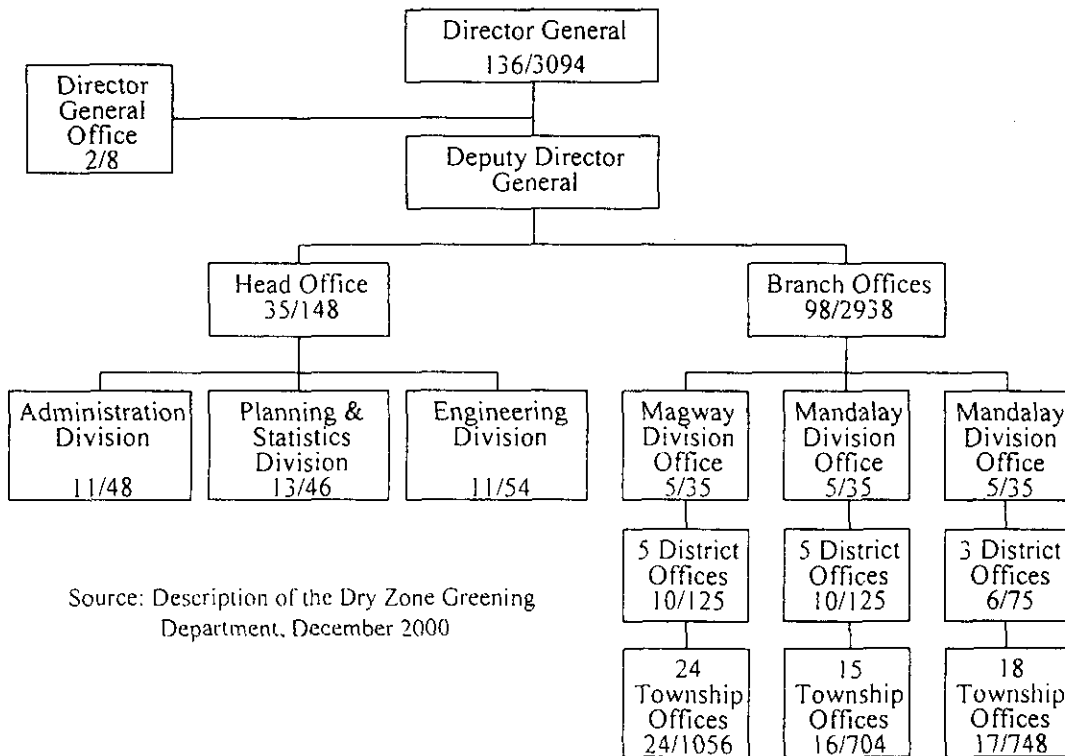
7.7.6 Dry Zone Greening Department (DZGD)

DZGD is a new department that was set up in 1997 in view of the importance of greening the Dry Zone. It has actually 1,534 staff, which is less than half of the prescribed number of 3,231. Designation of staff is delayed because it is a newly born department. The major tasks of this organization are identified as follows.

- 1) Establishment of forest plantations for environmental greening, for arresting desert-like formation, and for local supply,
- 2) Protection of the remaining natural forests,
- 3) Introduction and promotion of the utilization of wood fuel substitutes, and
- 4) Management and development of water resources.

This department is active in 3) "Dry Zone Integrated Plan (mentioned in Chp. 2.3.1 3))" and in tree planting (mentioned in Chp. 2.4.1 2)). It has a headquarters in Mandalay, 13 Districts offices and 57 Township offices. This means each District and Township in Dry Zone has both an FD office and DZGD office. Demarcation of these two departments is very complicated. DZGD is expected to establish forests for the firewood of the local population. However, the approval of the community forest is not the work of DZGD but the task of FD.

Figure 7.7.4 Organization of DZGD



Source: Description of the Dry Zone Greening Department, December 2000

7.7.7 Myanmar Agriculture Service

The land use plan and zoning of Dry Zone are based on soil type, agro-ecological zone and water resources. The importance of the agricultural land rates first among three grades in Myanmar. The MAS and the Ministry of Forestry undertake agricultural land conservation, afforestation for water harvesting, agro-forestry development, and soil conservation.

The Ministry of Agriculture and Irrigation has the following 13 departments/organizations under its umbrella: 5 departments, one public corporation, 5 national enterprises, Myanmar Agricultural Development Bank, and Yezin Agricultural University. The responsible organization for the development of agricultural technology and extension service is MAS, which was established in 1972 and has 18,615 staff. Its main task covers the followings:

- The increased production of major crops,
- The development of improved production technology through proper research on management of soil crop and pest control,
- Development of suitable high-yielding crop varieties,
- The transfer of appropriate crop production technology through agricultural extension program,
- Distribution of certified seeds through seed program,
- The provision of agricultural inputs,
- Classification of soils and advising on soil conservation techniques, and
- The exploration of export market on some agricultural produce.

MAS consists of the following nine divisions: 1) Central Agricultural Research Division, 2) Seed Division, 3) Land Use Division, 4) Agricultural Extension Division, 5) Procurement Division, 6) Project Monitoring and Evaluation Division, 7) Plant Protection Division, 8) Accounts Division, and 9) Administration Division.

According to a hearing from an extension officer of MAS, there are 53 staff, 24 of which are assigned to the central office in Nyaung-Oo Township. Each extension officer covers around 8 villages. Their recent major activities include distribution of imported paddy from China to farmers, biennial distribution of pulse seeds, and development of demonstration farms along roads (24 sites). Previously, the Government strictly controlled agricultural cultivation and designated crop patterns based on the production plan. However, the Government has allegedly already changed its policy from planned cultivation to free cultivation to promote farmers' economic incentives.

7.8 Joint Coordinating Committee

1. Functions

The Joint Coordinating Committee will meet at least once a year or whenever necessity arises, and work:

- (1) To approve the Annual Plan of Operation formulated by the Project in accordance with the Record of Discussions;
- (2) To review the overall progress of the technical cooperation program and activities carried out under the above-mentioned Annual Plan of Operation in particular; and
- (3) To review and exchange views on major issues arising from or in connection with the technical cooperation program.

2. Composition

(1) Chairperson: Director General, Forest Department (FD), Ministry of Forestry

(2) Vice Chairperson: Deputy Director General, FD

(3) Myanmar side

- 1) Director, Administration Division, FD
- 2) Director, Planning and Statistics Division, FD
- 3) Director, Training and Research Development Division, FD
- 4) Director, Extension Division, FD
- 5) Director, Budget and Account Division, FD
- 6) Representative, Dry Zone Greening Department, Ministry of Forestry
- 7) Representative, Planning and Statistics Department, Ministry of Forestry
- 8) Representative, Forestry Research Institute
- 9) Representative, Institute of Forestry
- 10) Representative, Myanmar Timber Enterprise
- 11) Secretary: Principal, Central Forestry Development Training Center

(4) Japanese side

- 1) Chief Advisor
- 2) Coordinator
- 3) Experts appointed by the Chief Advisor
- 4) Representative, JICA Myanmar Office
- 5) Personnel concerned to be dispatched by JICA, if necessary

Note: Official(s) of the Embassy of Japan may attend the Joint Coordinating Committee meeting as observer(s). Chairperson can request the attendance of Myanmar official(s) if necessary.

7.9 Information on Forestry and Agriculture in Dry Zone

7.9.1 Location and Topography of Dry Zone

Dry Zone is ringed by the Rakhine Range to the west, by the Bago Range to the south and by the Shan Plateau and the Eastern Range to the east. Most of the townships of the hill belts, which have elevations between 500 and 1800 feet formed and stretched by the ranges, have mostly flat topography with a little undulation. Mount Popa (4,891 feet), an extinct volcano, lies at the center of Dry Zone.

The above-mentioned Rakhine or the Western Range, which is located along the western coast, forms a natural barrier to the southwest monsoon, causing the monsoon rain clouds to push upwards avoiding Dry Zone and creating a rain-shadow effect. Thus, the area has historically been known to be dry, with annual precipitation falling far short of what is received in other parts of Myanmar.

As mentioned above, the central portion of the country belongs to the tropical semi-arid zone, where it is possible for plants to grow throughout the year in temperature, but only for 3 to 4 months in precipitation (Wilhelm Lauer and Frankenberg).

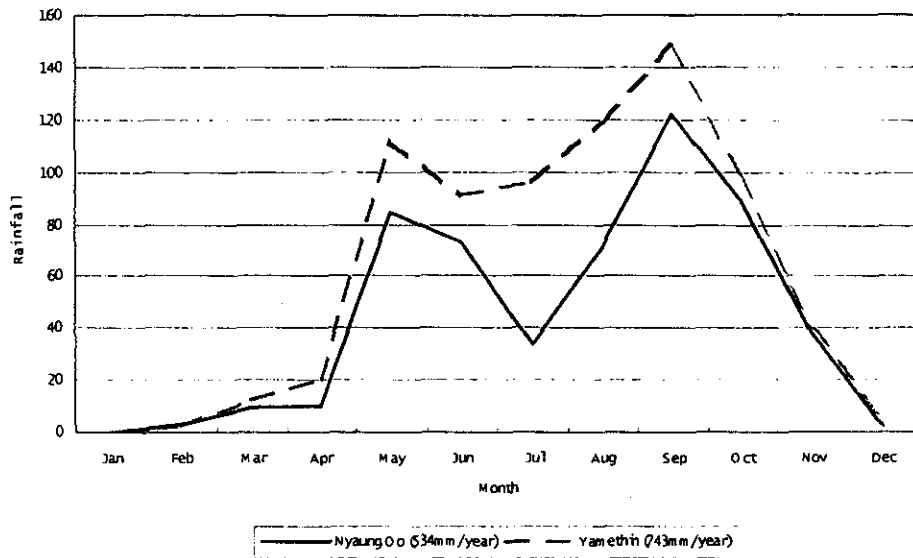
7.9.2 Climate

The first rainy season usually comes from mid or end of May to early June, after that it enters a small dry season with occasional rain from mid June to early August. The second rainy season continues from mid August to late September, followed by a complete dry season. Annual precipitation ranges from 500 mm to 1,000 mm with an average of 700 mm. They say that it rains more than 1,000 mm in the townships situated at the perimeter of Dry Zone, but less than 250 mm in the townships in the center where it tends to be dry. Figure 7.7.5. indicates the monthly rainfall of Dry Zone.

Monthly rainfalls of the past ten years in Nyaung-Oo Township located in the center of Dry Zone and in Yamethin Township at the periphery to the southeast are shown in the Appendix. As shown in the graph, there are two peaks of precipitation in May-June and September-October in Nyaung-Oo Township. It is very important to plant trees at the first peak of precipitation from May to June. While in Yamethin Township, the climate is not so severe with comparatively more rain.

Generally, temperature changes from the maximum of around 43 degrees °C in March and April, the hottest season, to the minimum around 8 degrees °C in January, the dry season. Average temperature in the hot season is around 32 degrees °C. The average annual humidity is around 63 % and during March to April, the hot season, it is around 42 %.

Figure 7.7.5 Monthly Rainfall of Dry Zone



7.9.3 Soil Type

Topsoil with organic matter does not exist in the most parts of Dry Zone. As a result of deforestation and removal of vegetation over a long period of time, there has been severe soil erosion by wind and water. Most parts have been covered with sandstone and shale or exposed bare rocks, making them unproductive. Even in the areas where topsoil still remains, it is usually only a thin layer. The main soil types are sandy loam and loamy sand consisting of yellow and brown colored crushed sandstone. Hard clay slate can be found in some areas, whereas the areas adjacent to Mt. Popa are covered with soil which has resulted from the volcano, and is more productive.

Luvissols, which have developed in the area with a definite dry season and have illuvial horizon of clay with high CEC, have been widely distributed in the central portion of Dry Zone (See Appendix). Luvissols seem to be disadvantageous for the growth of trees because of their alkalinity and high possibility of having hard pan (hard illuvial horizon of clay) at 30 to 50 cm level of subsoil, although they are said to be higher in productivity than Acrisols with clay illuviation.

7.9.4 Vegetation

The vegetation in Dry Zone is savanna type with scattered indigenous natural trees and classified into tropical open forest (FAO-UNESCO Soil Map). Tropical open forests include savanna formation in India and Myanmar and most of them have been degraded.

Forest type is a dry forest and the thorn tree species have been taking precedence. In the area where forests have not been degraded or mountainous areas, Dry Upper Mixed Deciduous Forest have been distributed rather in isolation in the central part of Dry Zone and in a

belt-shape at the perimeter.

7.9.5 Agriculture in Dry Zone

In the year 1998/99 the agriculture Sector had a 35% share of the GDP, 35% of the exports and 63% of the labor force (11.38 millions). Although its shares have been gradually decreasing, the agriculture sector remains basic in the national economy of Myanmar.

However, the annual growth rate of the agriculture Sector has stagnated at around 3.1% and this has caused various socioeconomic impacts on the national economy. It is pointed out that the recent poor crop of rice caused by unseasonable weather conditions has brought about the decrease of exports, furthermore, the rapid increase of consumer's rice price, which has been bearing heavily on the urban households, rural smallholders and landless farmers.

The primary reason of the above mentioned agriculture stagnancy is the unseasonable weather: flood and drought. However, it also implies that construction of irrigation dams in Dry Zone and the construction projects for expansion of double cropping in the delta zone by the government have not yet contributed sufficiently to stable agricultural production.

Secondly, a lack of capital is pointed out as one of the causes for delayed modernization. Farmers themselves in some areas have already induced agricultural modernization such as mechanization, usage of new improved varieties and introduction of chemical fertilizers. However, it is not yet common in the whole country. Expansion of commercial agriculture, reinvestments in agriculture and investment in other industries are proceeded in the suburban areas and border trade zones where farmers can enjoy expansion of vegetable and fruit productions and special demands for border trade. However, the country as a whole generally needs further promotion of public works in the agriculture sector.

7.10 Project by International or Other Agencies

7.10.1 Plantation Establishment by Korean International Cooperation Agency (KOICA)

- Project Title: Greening of Dry Zone of Central Myanmar
- Duration and Area: 3 years (1998-2000), 300 acres (122ha)
- KOICA Input: US\$ 180,000
- Implementing Agency: DZGD
- Annual Plan: 1998-Preparation, 1999-150 acres (61 ha) planted, 2000-150 acres (61 ha) planted

The Project irrigated the planted trees on the remarkably steep slopes. Water was taken in deep-wells (600-800 feet in depth) at the foot of the hill, and pumped up to the storing tanks at hilltop to irrigate the trees. They dug three points for the well, as the water volume was not sufficient.

7.10.2 Plantation Establishment Projects in Dry Zone by Japanese NGO's

a) Afforestation Project by Japan International Forestry Promotion and Cooperation Center (JIFPRO) – Myanmar-Japan Friendship Afforestation Project

The project has three sites; JIFPRO 1, JIFPRO 2 and JIFPRO 3. The afforestation at the site of JIFPRO 1, which was carried out from 1997 to 1999 with about 900 acres (365 ha), has already been completed. JIFPRO 2 (1998 – 2000, 1,100 acres or 446 ha) seems to have finished. And now JIFPRO 3, which planted trees in an area of 250 acres (101 ha) in 2000, is being implemented. The average annual afforestation area ranged from 300 to 400 acres (122 to 162 ha). All the three sites are in Nyaung-Oo township.

The planted trees in the project have been irrigated when necessary by bringing water in trucks from the Ayeyarwady River to the concrete water-tank, which has a capacity of 3,000 gallons installed at a hilltop. Most of the tree species planted (or more than 75 %) were *E. camaldurensis*, but this has been gradually decreasing and now it occupies only about 10 %. Recently, more indigenous tree species like Kokko (*Albizia* spp.) and Sha (*Acacia catechu*) are employed.

b) Afforestation Project by OISCA

Organization for Industrial, Spiritual and Cultural Advancement (OISCA international) is a Japanese NGO specialized in agriculture and forestry. Other than its own fund, OISCA uses the "Grass root grant program" of Japanese Government. The present afforestation project started in 1997 and completed 600 acres (243 ha) of plantation with an annual rate of 200 acres (81 ha). The fund for afforestation has been entrusted to FD, who has actually planted the trees in the project areas.

The Agro-forestry Training Center of OISCA is located in the suburbs of Pakkoku, the

right side of the Ayeyarwardi River and the center has been implementing plantation establishment and agriculture technology training for young farmers. At present, five Japanese personnel consisting of three men and two women are stationed at the OISCA office with five local staff. They are working on the guidance and training of trainees for subsistence farming including rice growing, poultry farming as well as tree planting. The duration for training is 10 months from May to March and they receive 10 male and 10 female trainees annually at the training center. The trainees have also participated in afforestation activities. In the agricultural sector, organic agriculture technology, seedling technology, improvement of groundwater quality and others, are improving the harvest.

c) Afforestation Project by Yomiuri Foundation

1,200 acres (486 ha) of plantation have been completed in the four years from 1996 to 1999 with an annual planting rate of 300 acres (122 ha). The 300 acres of plantation established in 1996 have been transferred to Ngapai village with 38 households. The 300 acres of plantation established in 1997 have been transferred to Ngaminmai and Htabauktau village with 92 households in total in the two villages. The 300 acres of plantation established in 1998 have been transferred to Sade and Htanaugwin villages with 61 in total number of households of the two villages.

As mentioned above, 900 acres (365 ha) of plantation for 3 years in total have been transferred to the above villages as the community forests on March 31, 1999. Their location is in Pinyinma. The survival rate of the plantations transferred was 76% in 1996, 88% in 1997 and 90% in 1998. 300 acres (122 ha) of plantation established in 1999 are under the management of Nyaung-Oo FD township forest office. 900 acres (365 ha) of transferred forests are protected forests. 24 community forest groups have been approved with 900 acres (365 ha) of forestry establishment.

3. 第 2 回短期調査協議議事録(M/M)

MINUTES OF MEETING
BETWEEN THE PREPARATORY STUDY TEAM (II)
OF THE GOVERNMENT OF JAPAN
AND THE AUTHORITIES CONCERNED OF
THE UNION OF MYANMAR
ON TECHICAL COOPERATION FOR
COMMUNITY FORESTRY TRAINING AND EXTENSION PROJECT
IN DRY ZONE
IN THE UNION OF MYANMAR

The Preparatory Study Team (II) of the Government of Japan (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Katsuro SAITO, was dispatched to the Union of Myanmar from June 17 to June 29, 2001. The purpose of the Team was to formulate a project for promotion of participatory forestry in Dry Zone requested by the authorities concerned of the Government of Myanmar.

During its stay in Myanmar, the Team exchanged views and had a series of meetings on the project with the authorities concerned of the Government of Myanmar.

As the result of the meetings, both parties reached common understandings concerning the matters referred to in the documents attached hereto.

Yangon, June 28, 2001



Toshimichi AOKI
Acting Team Leader,
Preparatory Study Team (II),
Japan International Cooperation
Agency (JICA)



For Director General,
U Shwe Kyaw
Deputy Director General,
Forest Department,
Ministry of Forestry,
The Government of the Union of
Myanmar

ATTACHMENT

1. The Team explained the scheme of the Project-Type Technical Cooperation of JICA, and the Myanmar side understood it.

2. The Forest Department will implement a project to promote participatory forestry in Dry Zone in cooperation with JICA after the agreement on and the signature of the Record of Discussions (hereinafter referred to as "R/D") on the implementation of Project-Type Technical Cooperation of JICA. The outline of the project is shown as follows.

2-1. Title of the Project

The draft title of the Project is "Community Forestry Training and Extension Project in Dry Zone" (hereinafter referred to as "the Project"). In order to express the objective of the Project more precisely, it was changed from the one; "Central Dry Zone Greening Project"

2-2. Basic Approach

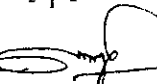
The Forest Department will conduct training on participatory forestry to materialize and promote Community Forestry Instructions (CFI, which were issued to enhance active participation of people to forestry by Director General of Forest Department, Ministry of Forestry in 1995.) Practical field extension of participatory forestry should be a part of the training. The extension staff are expected to acquire "people oriented extension style" that will put emphasis on the people's needs and voluntary participation.

2-3. Draft of the Project Master Plan

See ANNEX I

2-4. Draft of the Project Design Matrix (PDM)

See ANNEX II



2-5. Inputs from Myanmar Side

[Personnel for the Project]

(1) Project Director: Director General, Forest Department (FD)

(2) Deputy Project Director: Director, Training and Research Development Division,
FD

(3) Counterpart personnel:

1) Training and Research Development Division, FD

- Manager for extension planning
- Staff for extension planning

2) CFDTC

- Manager for training planning and coordination
- Staff for training planning and coordination
- Staff for curriculum development
- Staff for training material development
- Staff for training administration
- Lecturers
- Instructors

3) CFDTC Sub-center

- Manager for CFI extension practice
- Technical Supervisor for field extension practice
- Staff for extension practice

4) Administrative personnel

- Administration staff
- Secretaries
- Drivers
- Other necessary supporting staff

[Trainees]

(1) Extension Staff

FD will nominate staff of Township offices in Dry Zone as trainees. They are



expected to become extension staff. They will first attend training course at CFDTC, then conduct extension practices as a part of training (On-the-Job Training) after they return to their Township offices.

(2) Supervisors of extension staff

Heads of Township offices, which staff are nominated as extension trainees, and other supervisors in District and Division offices will participate in workshops on the instruction and support of the extension practices for their extension staff.

[Land and facilities]

(1) Land for;

- CFDTC
- CFDTC sub-centre

(2) Buildings and facilities for;

- Project office at CFDTC
- Training facilities at CFDTC
- Administration facilities at CFDTC
- Project office in FD
- Project field office at CFDTC sub-centre
- Training facilities at CFDTC sub-centre

[Project operation budget]

(1) Budget for training implementation

(2) Budget for field extension practices, including travel allowances for extension practices as On-the-Job Training

(3) Other necessary budget for the implementation of the Project

2-6. Inputs from Japanese side

[Long term experts]

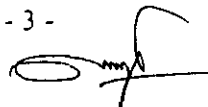
(1) A Chief Advisor

(2) A Coordinator

(3) Long-term experts in the following technical fields;

- 1) Extension Planning
- 2) Training

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3)Community Forestry Extension

Note: The Chief Advisor may serve concurrently as the long term expert in extension planning.

[Short term experts]

Short term experts of the following technical fields may be dispatched when necessary,

- 1) Facility Design (for the construction of CFDTC sub-center)
- 2) Construction supervising (for the construction of CFDTC sub-center)
- 3) Dry zone Silviculture
- 4) Nursery technique
- 5) Training curriculum development and training method
- 6) Development of teaching materials
- 7) Extension method
- 8) Participatory forest management
- 9) Social economic survey
- 10) Agricultural technology
- 11) Income generation

[Counterpart training in Japan]

2 – 3 counterpart personnel per year will be sent to Japan for training.

[Equipment]

(1)Equipment for

- Training
- Field extension

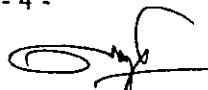
(2)Vehicles

(3)Other necessary equipment for the implementation of the Project

[Infrastructure]

Construction of CFDTC sub-center

The team considers the compound of Patheingyi Township Office of FD in Mandalay



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Division as the best location for CFDTC sub-center for following reasons.

- 1) Mandalay is centrally located in Dry Zone. And easy to access from Yangon.
- 2) Access road, electricity, and water are in good condition.
- 3) Wide and flat ground is available in the compound.
- 4) Near Mandalay Division office of FD

[Training Expenditure]

A part of expenditures for the training of extension staff, farmers, super visors and villagers.

2-7. Period of Cooperation

5 years

2-8 Project Location

Lectures will be conducted in CFDTC. Extension practices as *On-the-Job* Training will be conducted in selected villages in Townships which staff are nominated as extension trainees.

2-9. Executing Organizations

(1) Executing Agency

Training and Research Development Division, Forest Department, Ministry of Forestry

(2) Joint Coordinating Committee

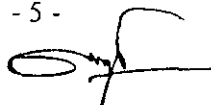
(Functions and composition of the committee will be decided over the course of discussion.)

3. Important assumptions and issues for special considerations

3-1. Continuation of Community Forestry Instructions (CFI)

The aim of the Project is to promote participatory forestry based on the procedures prescribed in CFI. In this sense, CFI is considered as the basis of the whole project.

3-2. Spontaneous participation of people in community forestry



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In the light of CFI's policy to encourage participation of people, community forestry should be initiated based on the needs of the people and their spontaneous motivation. Participation should not be forced.

3-3. Clear instructions from the territorial units for the application of CFI

In order to fully utilize the skills and knowledge of the extension staff provided by the training of the Project, clear instructions from the territorial units to the extension staff to pursue extension activities are indispensable.

3-4. Measures to solve land use conflicts in establishing community forests

At the time of site selection for community forests, special attention should be made to avoid land use conflicts. Measures such as thorough survey on land use rights, meeting of all stakeholders, should be taken before the selection of the sites.

3-5 Appropriate staff to participate in CFI training courses.

CFI training course of the Project comprises lecture in CFDTTC and extension practice as On-the-Job Training in the Townships which staff are nominated as extension trainees. Therefore, only those staff whose responsibilities are related to the extension services for CFI are encouraged to participate in the training.

The staff of DZGD from Nyaung-U District, which the site for Japan grant aid project; "the Project for Afforestation in Dry Zone in the Union of Myanmar" is located may be encouraged to participate in, if the area is planned to be transferred to villagers as community forests.

4. Steps to be taken before the commencement of the project

4-1 After the Team reports the results of its mission to the authorities concerned of the Government of Japan, JICA will prepare a draft final Project Document and send it to Myanmar side.

4-2 Myanmar side will submit written comments to the draft final Project Document to the Resident Representative of JICA Myanmar Office within 14 days after accepting it.

4-3 JICA will finalize the Project Document taking the comments into account.



4-4 R/D of the project will be signed by a Representative of JICA Myanmar Office and the Director General of Forestry Department. The Project Document will be an annex to the Minutes of Meeting, which is signed with R/D.

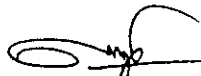
4-5 Myanmar side will submit official request form (AI form) for the services of long term experts as listed in R/D to the embassy of Japan not later than one month after R/D signed.

ANNEX I Draft of Project Master Plan

ANNEX II Project Design Matrix (PDM)

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- 7 -



ANNEX I Draft of Project Master Plan

1. Overall Goal

People in Dry Zone get benefit from community forests.

2. Project purpose

The participatory forestry management based on the Community Forestry Instructions (CFI) is promoted in Dry Zone.

3. Project Outputs

- (1) An extension plan for promotion of participatory forest management in Dry Zone based on the Community Forestry Instructions is prepared.
- (2) Extension staff understand the importance of participatory forestry management and acquire necessary skill and knowledge for extension through training.
- (3) Extension of participatory forest management is practiced in villages in Dry Zone as a part of extension staff training.

4. Activities of the Project

- 1-1) To study the current extension system
 - 1-2) To identify adequate extension procedures and methods
 - 1-3) To work out a desirable institutional set-up for extension
 - 1-4) To identify geographical priority areas for extension
 - 1-5) To identify required skills and qualification of an extension staff
 - 1-6) To formulate a training plan.
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- 2-1) To train trainers, lecturers, and instructors
 - 2-2) To formulate training curriculums
 - 2-3) To develop training materials including an extension manual
 - 2-4) To conduct training courses for the following categories of personnel
 - Extension staff in frontline offices
 - Managers / Supervisors of extension staff
 - 2-5) To conduct evaluation of training courses



- 3-1) To prepare manuals for villagers on CFI
- 3-2) To instruct and assist extension staff who are engaged in extension practices at following stages
 - Preparation of action plan for extension practices
 - Identification of possible target villages
 - Explanation on CFI to villagers and inquiry of their willingness to establish community forests
 - Provision of assistance to villagers in identifying adequate site for community forests
 - Provision of assistance to villagers in organizing users' groups
 - Provision of seed and Seedling to villagers
 - Technical guidance in the field to villagers
- 3-3) To conduct follow-up training for extension staff
- 3-4) To conduct seminars for villagers on CFI and necessary forestry technique
- 3-5) To conduct evaluation of extension practices
- 3-6) To conduct evaluation of performance of users' groups and their community forests.
- 3-7) To review the extension plan based on the experiences of extension practices

Note: In case in which the Master Plan should be changed due to the situation of the Project, both Governments will agree to and confirm the changes by exchanging a Minutes of Meeting.



ANNEX II Project Design Matrix (PDM)

Project Name : Community Forestry Training and Extension Project in the Union of Myanmar

Target Group : Extension officers, local residents

Target Area : Dry Zone

Period : 2001-2006

Date Prepared : 26 June 2001

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal People in Dry Zone get benefit from the forest.</p>	<p>1) 80% of community forests established during the project period continue to be managed by users' groups.(As of 2011) 2) New community forests continue to be established in more than 50% of Townships in Dry Zone after the termination of the Project.(As of 2011)</p>	<p>- Inventory of community forest</p>	
<p>Project purpose The participatory forestry management based on the Community Forestry Instructions (CFI) is promoted in Dry Zone.</p>	<p>1) Community Forests are established in more than 50% of townships in Dry Zone. 2) Non-members of users' groups do not claim against community forest. 3) Members participate in users' group based on their spontaneous motivation.</p>	<p>1) Inventory of community forest 2) Sampling survey 3) Sampling survey</p>	<p>-Drought, fire, harmful insects, and disease do not cause big damage to forest..</p>
<p>Outputs (1) An extension plan for promotion of participatory forest management in Dry Zone based on the CFI is prepared. (2) Extension staff understand the importance of participatory forestry management and acquire necessary skill and knowledge for extension through training. (3) Extension of participatory forest management is practiced in villages in Dry Zone as a part of extension staff training.</p>	<p>An extension plan is authorized by the Forestry Department. (by the end of second year) 2-1) Adequate numbers of qualified trainers are assigned. 2-2) All trainees pass the achievement test at the end of training course at CFDTTC 2-3) CFI Extension manual is prepared (by the end of first year) 3-1) CFI manuals for villagers are prepared (by the end of first year) 3-2) 80 percent of trainees are engaged in extension practice (6 months after each training course at CFDTTC)</p>	<p>Official letter from FD Director General 2-1) Record of assignment, and evaluation survey 2-2) Test record 2-3) Official letter from Project Director 3-1) Official letter from Project Director 3-2) Evaluation survey by the project</p>	<p>-Participation to users' group is not forced. -Conflict for land use does not occur because of the community forest.</p>

<p>Activities of the Project</p> <p>1-1) To study the current extension system 1-2) To identify adequate extension procedures and methods 1-3) To work out a desirable institutional set-up for extension 1-4) To identify geographical priority areas for extension 1-5) To identify required skills and qualification of extension staff To formulate a training plan.</p> <p>2-1) To train trainers, lecturers, and instructors 2-2) To formulate training curriculum 2-3) To develop training materials including extension manual 2-4) To conduct training courses for the following categories of personnel - Extension staff at frontline offices - Managers / supervisors of extension staff 2-5) To conduct evaluation of training courses</p> <p>3-1) To prepare manuals for villagers on CFI 3-2) To instruct and assist extension staff who are engaged in extension practices at following stages -Preparation of action plan for extension practices -Identification of possible target villages -Explanation on CFI to the villagers and inquire their willingness to establishing community forest -Provision of assistance to villagers in identifying adequate site for community forest -Provision of assistance to villagers in organizing users' group -Provision of seed and seedling to villagers -Technical guidance to villagers in the field 3-3) To conduct follow-up training for extension staff 3-4) To conduct seminars for villagers on CFI and necessary forestry technique 3-5) To conduct evaluation of extension practices 3-6) To conduct evaluation of performance of users' groups and their community forests. 3-7) To review the extension plan based on the experiences of extension practices</p>	<p>Inputs</p> <p>(1) Inputs from Myanmar side [Project personnel that including counterpart personnel] 1) Project Director: Director General, Forest Department (FD) 2) Deputy Project Director: Director, Training and Research Dev. Div., FD 3) Counterpart and administrative personnel from the following offices; - Training and Research Development Division, FD - CFDTTC. - CFDTTC Sub-center [Trainers] 1) Extension Staff 2) Supervisors of extension staff [Land and facilities] 1) Land for CFDTTC and CFDTTC sub-center 2) Buildings and facilities for training and administration [Project operation budget] 1) Budget for training implementation 2) Budget for field extension practices, including travel allowances for extension practices as on-the-job Training</p> <p>(2) Inputs from Japanese side [Long term experts] 1) Chief advisor 2) Project coordinator 3) Long-term experts in the following technical fields; Extension Planning, Training and, Community Forestry Extension [Short term experts] Short term experts may be dispatched when necessary. [Counterpart training in Japan] 2-3 counterpart personnel per year will be sent to Japan for training [Equipment] 1) Equipment for training and field extension 2) Vehicles 3) Other necessary equipment for the implementation of the Project [Infrastructure] Construction of the CFDTTC sub-center [Training Expenditure] A part of expenditures for the training of extension staff, supervisors, and villagers</p>	<p>-Township offices of FD allocate necessary budget for CFI extension. -Clear instructions for CFI extension is issued to the extension staff.</p> <p>Preconditions -FD does not negatively change CFI policy on community forestry.</p>
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4. 事業事前評価表

事業事前評価表（プロジェクト方式技術協力）

作成日：平成13年10月25日

担当部課：森林・自然環境部 森林環境協力課

案件名：ミャンマー乾燥地共有林研修・普及計画	担当部：森林・自然環境協力部
対象国：ミャンマー	実施地域：乾燥地(Dry Zone)※
実施予定期間：2001年12月15日～2006年12月14日（5年間）	

1. プロジェクト要請の背景

ミャンマー国の森林面積は国土面積（6,765万ha）の約51%（3,438万ha）を占めているが、1975～89年の14年間に毎年22万ha、さらに、1990～2000年の10年間には毎年51万7,000haの森林が減少し、同国の森林面積に対する森林減少率が年平均1.4%になるなど、急速な森林の喪失が大きな問題となっている。この問題の大きな要因としては、国全体が必要とするエネルギーの80%を薪炭材から得ており、その薪炭材供給のための伐採にあるとされている。

ミャンマー国政府森林局は、薪炭材伐採による森林減少・土壌流亡への重点対策地域として、乾燥地（Dry Zone）、ヤンゴン周辺、イラワジデルタ、シャン州山間丘陵部を挙げている。その中でも乾燥地は、他の地域に比べ乾燥が激しいこと、全人口の3分の1という多くの人々が居住していること等から、森林減少・土壌流亡の程度が特に激しい地域である。

以下に乾燥地の土地利用状況を示す。劣化した森林と焼畑林地を合わせると20%を越える一方、健全な森林は20%弱と、国土面積に占める森林面積と比較しても著しく低いことを示している。

中央乾燥地土地利用状況

土地利用区分	面積(ha)	割合(%)
健全な森林	1,720,161	19.7
劣化した森林	734,847	8.4
焼畑林地	1,134,813	13.0
農地	4,840,969	55.5
その他	170,888	2.0
水系	122,286	1.4
計	8,723,964	100.0

出所：乾燥地緑化局 “The Profile of Dry Zone Greening Department”

このような状況の下、ミャンマー国政府は1995年に発表された森林政策により、地域住民による住民参加型森林管理の促進を林政課題の重点の一つとして掲げた。また同年の森林局長通達である共有林令（CFI）によって、共有林の意義および設置の具体的手順が規定された。

ミャンマー国政府は、この共有林令(CFI)に基づく住民参加型森林管理を促進するため、森林局職員の普及能力の向上、および乾燥地の農村地域における緑化を通じた収入源創出を目的とした技術協力に関して、我が国に対し要請してきた。

2. 相手国実施機関

林業省森林局

3. プロジェクトの概要および達成目標

(1) 達成目標

1) プロジェクト終了時の達成目標

目標：乾燥地の全森林局タウンシップ事務所が共有林令（CFI）に基づく参加型森林管理を促進する能力を有している。

指標：ア、乾燥地のタウンシップの50%以上において共有林が形成される。

イ、中央林業開発訓練センターでの共有林普及研修に参加した普及員の90%が、研修終了後1年後でも普及活動を行っている。

2) 協力終了後に達成が期待される目標

目標：自発的な参加の下、住民が共有林からの便益を享受するため、森林局が共有林令（CFI）に基づく参加型森林管理を促進している。

指標：ア．2011年時点において、プロジェクト期間中に形成された共有林の80%以上がユーザーズグループによって継続的に管理されている。

イ．2011年時点において、乾燥地のタウンシップの50%以上において新規の共有林の形成が行われている。

ウ．2011年時点において、ユーザーズグループのうち、少なくとも10グループ以上（協力期間初期段階に組織されたもの）が、共有林で収穫した林産物を利用している。

(2) 成果・活動

上記の目標を達成するために以下のような成果を目指した活動を行う。

成果1：共有林令（CFI）に基づいた参加型森林管理の普及計画が策定される。

- 1-1 現状の普及体制を調査する。
- 1-2 適切な普及手順および手法を特定する。
- 1-3 望ましい普及実施体制を立案する。
- 1-4 普及活動の地域的な優先度を特定する。
- 1-5 普及担当職員が備えるべき技術、資質を特定する。

成果2：研修を通じ普及担当職員が参加型森林管理の重要性を理解し、普及に必要な知識、手法を身につける。

- 2-1 訓練講師を養成する。
- 2-2 訓練カリキュラムを策定する。
- 2-3 普及マニュアルを含む訓練教材を開発する。
- 2-4 以下の階層を対象とした研修を実施する。
 - 森林局タウンシップ事務所の普及担当職員
 - 上記職員の指導・管理職
- 2-5 研修の評価を行う。

成果3：普及担当職員への研修の一環として、乾燥地の村落において参加型森林管理の普及活動が実践される。

- 3-1 住民向けのCFIに関するマニュアルを作成する。
- 3-2 普及実習を行う普及担当職員を指導、補助する。
- 3-3 普及担当職員に対して補完研修を行う。
- 3-4 住民に対してCFIおよび必要な林業技術についてのセミナーを実施する。
- 3-5 普及実習について評価を行う。
- 3-6 ユーザーグループとその共有林の状態について評価を行う。
- 3-7 普及実習の経験に基づき、普及計画の見直しを行う。

(3) 投入

日本側 投入額概算 約4.8億円

- ・長期専門家：4人×5年間（チーフアドバイザー、業務調整、研修・訓練、共有林普及）
1人×1年間（普及計画）
- ・短期専門家：必要に応じて、2～4人/年×1～2ヶ月
- ・カウンターパート日本研修：2～3人/年×1～3ヶ月
- ・プロジェクト用資機材

・中央林業開発訓練センターのサブセンター建設

ミャンマー側

- ・カウンターパートの配置（普及計画、研修・訓練、共有林普及）
- ・土地・施設（中央林業開発訓練センター、サブセンター）
- ・プロジェクト運営資金
- ・機材

（４）実施体制

林業省森林局局長がプロジェクト・ディレクター兼合同調整委員会の委員長として、プロジェクトの実施に関する責任を負う。森林局研修・研究開発部長が副プロジェクト・ディレクターとして、プロジェクトの運営および技術面の責任を負う。

森林局職員に対する研修は中央林業開発訓練センターにて行い、同センターにプロジェクトオフィスを設置する。また、マンダレーにサブセンターを建設して、住民及び普及担当職員の訓練施設として活用するとともに、サブセンター内に普及活動の拠点としてプロジェクトフィールドオフィスを設置する。

４．評価結果（実施決定理由）

以下の視点からプロジェクトを事前評価した結果、協力を行うことは必要かつ妥当と判断される。

（１）効率性

本件実施のために必要な日本側の投入としては、専門家派遣や研修員受け入れの経費に加え、サブセンター建設および研修実施経費の一部が含まれるが、高額機材の導入も必要ないことから、投入費用は最小限に抑えることが可能である。また、本件の実施に伴ってミャンマー側で追加的に必要となる投入は、カウンターパートの旅費や研修施設の維持管理費等であり、これまでの予算支出規模を大きく上回るものではない。

これに対して本件の具体的な成果としては、乾燥地の全森林局タウンシップ事務所から各３名程度、合計約１８０人に対し研修を施し、実地研修を通じて乾燥地全域に実際の共有林が形成されることとなる。これまで乾燥地において共有林令（CFI）に基づいた共有林形成の実績がほぼゼロに等しいことおよび本件実施により共有林造成普及のシステムが整備されることに鑑みれば、本計画の効率性は高いといえる。

（２）有効性（目標達成見込み）

全森林局タウンシップ事務所を対象として、普及担当職員に対する研修を実施する。右研修には各研修生の所属地域における実地研修を含み、実際の共有林形成を行う計画であり、対象地域の自然条件、土地利用条件等の制約を考慮に入れても、プロジェクト目標達成の指標（ア）は達成見込みは高いといえる。指標（イ）については、森林局の予算措置および人員配置などに左右されるところであるが、森林局は共有林造成普及をタウンシップ事務所の通常業務に組み込むことを確約していることから、達成の可能性は高い。これらを通じ、プロジェクト終了時の達成目標は、高い確率で達成することが可能である。

（３）効果（インパクト）

本計画の実施により、環境面、森林局の組織・制度面、社会面のいずれに対しても高いプラスのインパクトが期待できる。環境面では、森林局および乾燥地緑化局による政府直営造林に加えて、住民による森林の拡大、保全が見込まれる。組織・制度面では、これまで実質的に機能していない森林局の普及機能の整備が期待される。また、その内容として、トップ・ダウンの森林行政から、住民主体の森林管理への転換が含まれる。さらに、共有林形成により農民が合法的に農林用地を所有できるようになることは、社会的に大きなプラスのインパクトといえる。経済面に関しては、本計画が大規模な経済林の形成を目的としたものではないことから、高い経済的なインパクトは期待できないが、住民による林産物の処分が可能になることから、家計と地域に対する小規模な経済効果は期待できる。

一方、共有林の形成に対して強制が行われたり、土地利用を巡る農民間の争いが発生しないよう、十分な措置をとるよう両国関係者間で確認がなされており、マイナスのインパクトを最小限に抑える配慮がなされている。以上から、本プロジェクトは総合的に高いインパクトをもたらすものと期待される。

(4) 妥当性

ミャンマー森林政策（1995年）において住民参加の促進は政策目標の一つに明記されている。また、1995年の森林局長通達である共有林令（CFI）は、共有林の意義および設置の具体的手順を規定しており、本計画実施の具体的根拠となっている。このとおり、本計画はミャンマー国の政策に合致している。

また、環境保全はJICAのミャンマー国別事業実施計画で優先課題の6項目の一つとして取り上げられており、本件実施による環境改善は援助課題の解決に寄与するものとなる。以上から、本計画の妥当性は非常に高いと判断される。

(5) 自立発展性

過去の協力案件の評価に基づくと、森林局は協力の成果を着実に定着・発展させてきた実績があり、本件においてもその基本的な傾向は維持されるものと考えられる。森林局は、共有林の普及活動を展開するための十分な組織能力を現時点では有していないが、本計画では森林局のタウンシップ事務所の組織能力向上そのものを目標としており、望ましい普及実施体制の構築を目指すものである。また、本件実施に必要なミャンマー側投入は、経常経費である職員の人件費や施設の維持管理費の他は、研修の実施に必要なカウンターパートの出張旅費や農民に配布する苗木生産費等であり、森林局の予算規模を大きく超過するものではない。したがって、プロジェクト目標の達成により相当程度の自立発展性が見込まれる。

5. 外部要因リスク（外部条件）

留意すべき外部要因リスクとして、次のものが想定される。

- ・森林局が共有林令(CFI)を、廃止ないしは実効性を弱める方向に変更しないこと。
- ・農民がユーザーズグループへ参加することを、森林局から強制されないこと。
- ・共有林により土地利用を巡る農民間の争いが発生しないこと。
- ・研修に参加した森林局職員が共有林普及活動に適切に割り当てられること。
- ・異常気象、病虫害の発生による影響がないこと。

6. 今後の評価計画

(1) 今後の評価に使う指標

1) 中間評価時の指標

- ・森林局によって普及計画が承認される（計画1年目終了時）
- ・中央林業開発訓練センター及びサブセンターに、十分な指導能力を備えた指導員の人数が適切に割り当てられている。
- ・研修生全員が研修修了後の試験に合格する。
- ・普及担当職員用のCFI普及マニュアルが作成される（計画1年目終了時）
- ・農民用のCFI普及マニュアルが作成される（計画1年目終了時）
- ・中央林業開発訓練センターでの研修修了後、実地研修として共有林普及活動を継続している研修生（普及担当職員）の割合（80%、センターでの研修修了後6ヶ月後時点）

2) 終了時評価時の指標

- ・共有林が形成されたタウンシップの割合（50%以上、プロジェクト終了時）
- ・研修修了後、共有林普及活動を継続している研修生（普及担当職員）の割合（90%、修了後1年時点）

3) 事後評価時の指標

- ・協力期間中に形成された共有林がユーザーズグループによって継続的に管理されている割合（80%、2011年時点）
- ・新規の共有林が形成が行われているタウンシップの割合（50%以上、2011年時点）
- ・共有林で収穫した林産物を利用しているユーザーズグループ数（10グループ以上、2011年時点）

(2) 評価スケジュール

中間評価（2004年1月頃）、終了時評価（2006年6月頃）、事後評価（2011年頃）を実施予定

※マンダレー、ザガイン、マグウェーの3管区60タウンシップ中57が乾燥地（Dry Zone）に該当する。

5. 分野別報告

(1) 社会林業分野

平成 13 年 1 月 5 日

短期調査団報告書(社会林業分野)

森林総合研究所九州支所

鶴 助治

1. ミャンマーにおける社会林業のスタートとその政策的重要性

ミャンマー国には 1902 年に制定された森林法がある。この法律は制定以来、何回かのマイナーな修正が行われてきたが、1941 年に小改正を行って以来、1992 年にはその歴史上初めての抜本的な大改正が行われた。

その最大の変更点は、それまで国(森林局)が一手に、かつ全面的に担うというミャンマーにおける森林の造成や維持・管理の基本政策を大きく方針転換し、民間や地域住民の役割を認めたことにある。

世界的に見ると森林の保管理に地域住民の参加を求める手法は、1970 年代後半からその必要性が強く叫ばれだし、今では多くの熱帯諸国での森林管理手法として一般的に普及しているが、この国ではそれより 10 年以上も遅れて、1992 年に改正された森林法によって初めて謳われた。

その理由は、(1)人口の急増により森林資源に対する圧力(薪炭材需要の増大、農地への転換、放牧の増大等)の強まりによって森林の劣化が進み、早急な森林保全対策の必要性が認識されたこと、(2)急速な森林の劣悪化に対応するには、従来のように森林の造成・保全・管理を森林局のみが担うやり方では財政的および人的資源の面で困難なことが認識されたこと、にある。

森林局による造林実績は 1970 年代までは年間 3 千 ha 前後であったが、80 年代になるとそのおよそ 10 倍の 30 千 ha 前後に急速に増大した。しかし、そのレベルでも森林局のみでは住民の薪炭材需要を満たし、森林の減少を防ぐことはできないと判断され、これ以降、住民による森林管理の促進がこの国の森林政策上の大きな課題となった。U Uga によると community forestry として活用しうる劣化した森林の面積は全体で 500 万 ha、国土の 7.5% に上り、そのほとんどが中央乾燥地に位置していると推定している。

1992 年改正森林法(抜粋)

第 5 章 植林地の造成(ミャンマー森林法 1992)

第 13 条 森林局長は林業大臣の認めるところに従い、林地あるいは政府が自由に処分できる土地に次のような造林地を造成することができる。

(a) 商業的造林地、(b) 産業的造林地、(c) 環境保全的造林地、(d) 地元供給用造林地、(e) 村落薪炭造林地、(f) その他の造林地

第 14 条 もし政府からの許可が得られた場合、

(a) 政府およびいかなる個人およびいかなる組織も共同企業として実行する権利を有する

(b) いかなる個人あるいはいかなる組織も、村落住民によって彼ら自身の用途のために造成された村落所有の薪炭林を除き、その条項に基づき造林地の造成と維持を実行することができる。

第 15 条 森林局長は、Reserved Forest あるいは Protected Public Forest、村落近くにある政府が自由に処分できる土地に対して、条項に従って次のような村落所有薪炭林を造成する許可を与えることができる。

(a) 森林局によって一定期間の間に造成され、村落所有のものとして譲渡され維持される薪炭林

(b) 集団的労働によってその村落によって造成・維持され、そして利用される村落所有の薪炭林

しかし、92 年に森林法は改正されたものの、その具体的な方針が行政レベルで示されたのはその 3 年後の 1995 年 Forest Policy Statement であった。ここで 6 つの主要な政策目標が示され、その中でも特に強調されたのが森林保全と利用における住民参加である(“It stresses significantly on community participation in forestry and emphasizes forestry for people.” (Kumar P. Upadhyay: *Forest policy, forest law and community*

forestry notification - linkages and gaps, p.2, 1995)).

1995 Forest Policy Statement

2. 責務

この政策は、より幅広い国家的なゴールと目標を達成するために政府がもっとも高いプライオリティを与えなければならない6つの責務(imperative)を確認する。

- (1) 土壌、水、野生動物、生物多様性、環境の保護
- (2) 現在および将来の世代のために森林から発生する有形、無形の恩恵を永久に確保するための森林資源の持続性
- (3) 燃料、シェルター、そしてレクリエーションに対する人々の基本的なニーズ
- (4) 社会経済的に優しいやり方で、森林資源の経済的な全能力を利用するための効率性
- (5) 森林の保全と利用における住民参加
- (6) 国民の安寧と社会経済的発展における森林の決定的な役割についての住民の意識の喚起

3. 10 住民参加と住民意識

目標

- * 「住民に依拠した開発」を行い、同じく住民の意識と、森林の保護と保全に対する大規模な動機付けを行うために、林業部門の開発活動における住民の参加を得る

政策手段

- * 森林局の普及能力を強化し、林業計画におけるより大きな住民参加のためのメカニズムを開発する
- * 持続可能な林業開発の環境的、社会的および経済的な便益を識別し、宣伝する
- * 集落林業の意識とそれが表明しようと努める問題点の重要性を創造する
- * 集落開発計画の費用/便益、および住民による計画の採用を促進するために便益の配分のメカニズムを実証する

さらにこれに基づき同年に Community Forestry Instruction (CFI) が制定され、住民自身が森林の保全と利用に参加する際の具体的な手続きや権利、義務等が示された。これにより、現場レベルでの住民参加による森林管理が実行に移される準備が整えられた。

表一 96年度の短期専門家報告書から引用した当時の Community Forestry の設立状況である。スタート直後ということもあって、まだきわめて少ない数であり、最新の設立状況のデータをミャンマー側に要求中である。

表一-1 ミャンマーにおける Community Forestry の状況 (1996年度短期専門家報告書より)

State/Division	District	Township	Household	Area(Acres)	Acre per household	注
Ayeyarwady	Myaungmya	Mawgyun	235	1,294	5.5	申請時の数値
"	Pyapon	Bogalay	573	4,160	7.3	"
Shan	Taunggyi	Pindaya	478	533	1.1	"
Magway	Minbu	Nga Pe	24	200	8.3	"
"	Magway	Magway	3,788	1,250	0.3	許可済み
Sagain	Monywa	Chaung Oo	500	195	0.4	"
Mandalay	Myingyan	Kyaukpadaung	-	460	-	"
Total			(5,598)	8,092	(1.4)	

注) Total の括弧内の数字は参加家族数の不明な Mandalay を除いた合計および平均値である。

表一 1996年度の短期専門家報告書から引用した数字であり、現在はもっと多くの Community Forestry が設立されていると思われるが、最新の情報の提供をミャンマー側に要請中である。

2. 普及組織の設置とその活動の状況

地域の森林保全に住民参加を促す際に必要不可欠なのは、普及組織である。森林局のそれまでの主な活動は Reserved Forest の管理を主体としており、住民を対象とする部局は存在しなかった。しかし、住民参加を促進することが大きな政策課題となって、1992 年改正森林法にもとづき普及部が設置され(1995 年)、その早急な強化が求められた(“There is an urgent need to transform the territorial organization of the Forest Department (FD) to an advisory and extension service oriented organization.”, (Tej B. S. Mahat, *Forestry Extension and community forestry development strategies for Myanmar*, 1995).

しかし、森林局内に設置された森林普及部(Forest Extension Div.)は Officer が 12 人配置されることになっているが、定員が満たされていない。また、本局の普及部の職員の仕事はテレビ放送用(ミャンマーTVなどから全国放送)のビデオやパンフレット、国民の休日における展示物などの作製が主な仕事である。また、中央乾燥地緑化局内に設置される予定の普及部署も掲示板の設置などが主な仕事になると見られる。

また、森林局内の普及部署も中央乾燥緑化局内にしか設置される予定の普及部署も、いずれも本局内部に限定されており、住民を直接の対象とした普及活動の最前線となるべき District Office や Township Office には設置されていない。“Currently the township forestry offices in Myanmar are largely government land management agencies which have continued with their traditional protection and authority functions.” ditto)とは 1995 年の資料に見られる表現であるが、この表現は現時点でも大きな修正を要しないであろう。

このように、森林局の業務が伝統的に Reserved Forest の管理・取り締まりを中心としてきたため、ほとんどの職員は住民参加による森林管理という意識は薄く、普及の経験はもちろん、その知識さえも十分でないのが現状である。

3. CFDTTCによる社会林業および普及に関する訓練体制

こうした中であって、1990 年8月にスタートしたミャンマー中央林業開発訓練センター計画(CFDTTC計画)は森林局職員および地域住民に対する森林・林業の教育・訓練を目的としての多くの研修実績を残してきた。

さらにそのアフターケア(1999 年4月から2年間)においては、中央乾燥地の緑化のために地域住民の参加による薪炭林造成の促進を図る必要があるとして、森林局職員の社会林業及び林業普及に関する訓練実施体制の強化を目的として技術協力を実施している。99 年度計画では全部で 20 の研修コースで延べ 2300 人・週の研修を行い、この国の森林局職員の教育・訓練に大きく貢献している。

とはいえ、林業普及、普及手法のコースに限るとまだ 344 人・週(実人員 156 名)にとどまっており、この国で住民参加型の森林管理を推進して行くには普及の訓練を受けた職員数はまだまだ絶対的に不足している。

さらにCFDTTCの社会林業・普及の教育・訓練活動における決定的な弱点は、普及の現場をもっていないという点である。研修生が training forest はあるものの普及の現場をもっていないために講義を主体としており、現地において実際に住民と接し、住民のニーズを聞きながら実践的に研修を受ける仕組みになっていない。社会林業・普及の訓練においては直に住民と接することの重要性は、機械の研修コースで実際に自ら機械に触り、自ら操作するのが不可欠に重要なことに等しい。現在のCFDTTCの社会林業・普及の研修コースではこの点が決定的に問題である。従って社会林業・普及の研修コースを受講しても、その理解はあくまでも概念的なレベルでしかなく、訓練終了後、それぞれの職場に戻っても研修の成果を実地で活かすことができないのが現状である。

4. ミャンマーにおける社会林業・普及の基本的な問題点

以上のことから、ミャンマーにおける社会林業・普及の基本的な問題点は次の点にある。

- (1) CFDTCにおける社会林業および普及の研修コースにおいて実践的な知識と経験を持つ普及職員を養成するために、住民と直に接し、そのニーズを汲み上げつつ森林管理に参加させる実地研修の場をもつことが必要不可欠である
- (2) 現在の段階では、全体としてみると森林局自体が参加型の森林管理の重要性を考え方としては理解していても、本局の普及部の活動の内容及び普及部署が District や Township レベルに設置されていないことからみても、実態が伴っていないように思われる。とくに、普及の最前線となる Township Office レベルではこれまでの通常業務に追いつかれ、また普及活動が今日の重要な活動業務として位置づけられていないため、住民を直接の対象とした普及活動を行うという雰囲気乏しい。このため、CFDTC による実践を伴った普及職員の要請を行っても、実際に集落の住民と接し、研修の成果を現場に生かす機会がない。

5. 今後の取り組み方向

以上のことから、今後の社会林業分野において取り組むべきと考えられる点は次の通りである。

(1) 実践を伴った社会林業普及の訓練

CFDTCはミャンマーにおける森林局職員の訓練機関として重要な役割を果たしているが、社会林業分野で実際に住民と接し住民の森林管理への参加を求めうる職員を養成するには研修過程で実践的な経験を積ませる必要がある。現在のCFDTCではこの部分が欠けていることが大きな欠点である。したがって、現場を持ち、訓練生もそこで一定の期間、住民と直に接する経験をもたせることが必要である。

(2) Township Officer 等、地域における意志決定者も社会林業の訓練コースを受けさせる

社会林業の訓練を受けた職員が持ち場に戻っても、社会林業が彼の日常的な業務として認められなければ実際の活動を行うことはできない。それを行うためには上からの命令や許可、あるいは認知が必要であり、その点で Township Officer の社会林業に対する理解度が研修の成果を生かして社会林業活動を行うことができるかどうかを左右する。したがって、Township Officer や District Officer レベルの職員も社会林業の訓練対象とし、社会林業に対する理解度を高めることが必要である。

(3) 住民に対する森林教育・啓蒙を行う

中央乾燥地では森林の劣化が進んでいるとはいえ、聞き取りによる限り、水や道路、教育、病院に対するニーズは高いものの、森林造成に対するニーズは低い。これは住民が生活用に使用する薪炭材は従来、unclassified forest (あるいは Reserved Forest や Protected Public Forest への encroach) や農地の周辺から手に入れることができるし、わざわざ人手をかけてまで造成するまでのものではない、という認識を示したものであると考えられる。しかしながら、実際には彼らの周辺の森林は次第に減少し、彼らが薪炭材の採集に要する時間は着実に長くなっており、近い将来に大きな困難に直面することは確実である。したがって、森林に関する普及啓蒙活動を本局レベルではなく、village あるいは住民レベルで行うことが必要である。

(4) NGOとの連携・協力

地域の森林管理に住民の参加を得るためには、同時に住民のニーズを聞き入れ、生活・所得の向上を図る努力が必要である。そのためには水や道路、教育、病院等、住民の多様なニーズをできることから

解決していくことが必要である。このため、想定されるプロジェクトでは解決できない部分についてはミャンマー国の他の関係部局や地域で活動して実績のあるNGOとの連携・協力を模索すべきである。

(5) 農家所得の向上

中央乾燥地の土壌は土壌の養分の溶脱が激しく、生産性が低い。このため、コンポストやEM菌を活用した土壌改良の指導を行ったり、Community Forestry などにも林業樹種ばかりでなく、毎年の現金収入が期待でき、枝条は薪炭材としても利用できる果樹を導入することなども考慮すべきである。

(6) 「強制労働」と誤解されない配慮

住民参加方式は参加住民全員の十分な理解無しで行うと、「住民の強制的な参加」と誤解される可能性がある。そうした誤解を招かないためにも、住民の十分な理解を得ることがきわめて重要である。そのためにも地域住民に対する森林の重要性に対する事前の啓蒙活動が不可欠である。また、住民の十分な理解を得て進めることのできる社会林業普及員の養成も不可欠であるといえる。

(2)乾燥地造林分野

ミャンマー中央乾燥地緑化計画短期調査帰国報告会資料

乾燥地造林分野

2001年1月5日

1. 自然条件(気象、土壌、植生)

ミャンマー中央部は熱帯半乾燥地帯に属し、気温面から植物の成育は1年中可能であるが、水分摂取の面からみた植物成長期間が3~4ヶ月の地帯に属している(Wilhelm Lauer and Peter Frankenberg)

(1)気象：

降雨：

通常5月中下旬から6月上旬の間が第1雨期であり、その後6月中旬~8月上旬にかけて少量の降雨があるものの、小乾期に入る。第2雨期は8月中旬から9月下旬まで続き、その後本格的な乾期に入る。年間降水量は、500mm~1,000mmの間で変動し、平均700mmである。乾燥地の境界周辺に位置するタウンシップでは、1,000mmを超える降雨を有するものの、乾燥地中央部の乾燥し易い地域では、250mm以下の雨量しか有しない個所もあると言われている。

中央乾燥地の中央よりやや北よりのミンジャン(Mingyan)における過去10年間(1990~1999)における月別平均降水量は下表のとおりである。

1	2	3	4	5	6	7	8	9	10	11	12	年計
1.3	4.1	6.5	20.3	82.8	100.9	52.8	114.7	168.5	80.89	34.75	3.0	670.54

温度と湿度：

一般に温度は、暑気シーズンである3月、4月の最高約43℃から1月の約8℃まで変化する。暑気における平均気温は、約32℃である。年平均湿度は約63%、暑気シーズンである3月、4月の期間では、約42%である。

前述のミンジャンにおける過去10年間の月別平均気温は次表のとおりである。

1	2	3	4	5	6	7	8	9	10	11	12
21.82	24.13	28.46	31.54	31.43	30.82	29.50	29.09	28.51	27.99	24.68	22.43

(2)土壌型

有機物層を含む表土は大抵の地域で存在していない。数十年に亘る森林減少や地表植生の除去の結果、風水による土壌侵食が生じている。大抵の区域は砂岩や頁岩で覆われ、基岩が露出し、生産力は高くない。表土が残存している区域でも表土層は薄い。

主たる土壌型は、砂質ロームであり、黄褐色の破碎された砂岩からなっている。一定の地域では、堅い粘土層が見出される。一方ポパ山に近接した地域では、かなり生産性のある火山由来の土壌に覆われている。

FAO-UNESCOの世界土壌図(1/500万)の分類によれば、中央乾燥地域に出現の可能性が高い土壌は、以下の4種である。

- Chromic Lubisols(Lc) : 明るい色した粘土集積土壌
- Ferric Lubisols(Lf) : 鉄の集積あるいは斑点がみられる粘土集積土壌
- Humic Gleysols(Gh) : 有機物の含有率が高いグライ土
- Ferralsols(Bf) : 鉄あるいはアルミの二酸化化合物がみられる変化の途上にある土壌

乾燥地帯の中央部には Lubisols(明瞭な乾期を持つ地帯に生成される明瞭な粘土集積層を持ち塩基飽和土の高い土壌)が広く分布している(森林局作成の土壌図より)。同じ粘土集積を持つアクリソルより生産力が高いとされているが、土壌がアルカリ性であることと、下層 30~50cm の位置にハードパン(堅い粘土集積層)を有する可能性が高く樹木の育成にとって不利である。

(3)植生:

ミャンマー中央乾燥地域の植生は、郷土樹種が散在するサバンナタイプの植生である。前述の FAO-UNESCO の土壌図における植生分類によれば、熱帯疎林(Tropical open forest)に区分されている。熱帯疎林は、インド、ミャンマーにおけるサバンナ状態を示す植生帯で、その多くは荒廃していると言われている。

森林タイプ及び樹種:

刺を有する樹種が優先する等乾燥林タイプのものが分布している。森林が劣化していない地域(主として山岳地)では、乾燥落葉混交林(Dry Upper Mixed Deciduous)が孤立して存在している。乾燥地の周辺地域でも乾燥落葉混交林が帯状に分布している。

今回の調査で自然植生として確認された主たる樹種は以下のとおりである
インドセンダン (*Azadirachta indica*)、タガヤサン (*Cassia siamea*)、タマリンド (*Tamarindus indica*)、リウコフロエアアカシア (*Acacia leucophloea*)、アセンヤクノキ (*Acacia catechu*)、ビルマネムノキ (*Albizia lebbek*)、サネブトナツメ (*Zizyphus jujuba*)、乾燥チーク (*Tectona hamiltiniana*)、ホウオウボク (*Delonix regia*)、オウゴチョウ (*Caesalpinia pulcherrima*)、インドボダイジュ (*Ficus religiosa*)、サトウヤシ (*Arenga pinata*)、タナカ (*Limonia acidissima*)である。

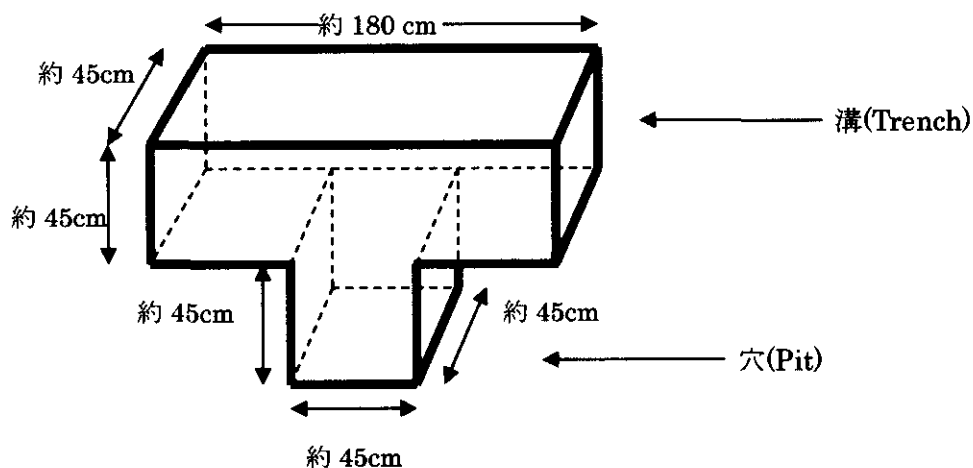
ビルマカリン (*Pterocarpus macrocarpus*)は乾燥地や落葉混交林の周辺に分布し、また、チーク (*Tectona grandis*)も広く分布しているが、成長も悪く、木の質もよくないと言われている。

なお、タケ類として乾燥したやせ地にも強いバンス (*Dendroclamus strictus*、ミャンマー名 Myinwa)等が分布するという。

2. 中央乾燥地での造林方法

中央乾燥地においては、植え穴として基本的に下図のような溝穴(Trench and Pit Method)を掘ることにより、植栽木への集水を図ると同時に、主根の下層への伸長を図っている。苗木は中央の穴(pit)の位置に、地表面又はそれよりやや低い位置に土壌を埋め戻すことにより植栽される。苗木の位置は、植栽地の冠水の程度により多少高低が変化する。

植栽溝の図



植栽密度：12×12 フィートが基準(約 770 本/ha)、アグロフォレストリーの場合は 6×24 フィートが適用される場合がある。

植栽時期：活着率を上げるためには、5～6月の第1雨期を利用することが重要である。第2雨期(8月～9月)は、次期乾期(特に翌年の2～4月)に備えるための根の伸長に利用すべきとされている。

3. 中央乾燥地での造林樹種

森林局との協議時(12月23日)に提出された、中央乾燥地を対象とした植栽樹種は別表のとおりである。

中央乾燥地を対象とした植栽樹種(乾燥地緑化局より)

和名		学名	ミャンマー名
1 ユーカリ類	*	<i>Eucalyptus</i> spp	Eucalypt
2 アルビジア類		<i>Albizzia</i> spp	Kokko
3 ビルマネムノキ		<i>Albizzia lebbek</i>	Myanmar Kokko
4 セリンパール		<i>Homalium longifolium</i>	Phaukseik
5 インドセンダン	*	<i>Azadirachta indica</i>	Tama
6 タガヤサン	*	<i>Cassia siamea</i>	Mezali
7 タマリンド	*	<i>Tamarindus indica</i>	Magyi
8 リウコフロエアアカシア	*	<i>Acacia leucophloea</i>	Tanaung
9 アセンヤクノキ	*	<i>Acacia catechu</i>	Sha
10 アカシアマンギウム		<i>Acacia mangium</i>	Mangium Sha
11 セネガルアカシア	*	<i>Acacia senegal</i>	Senegal Sha
12 カマバアカシア	*	<i>Acacia auriculiformis</i>	Auri Sha
13 アラビアゴムモドキ		<i>Acacia arabica</i>	Subyu
14		<i>Acacia holosericea</i>	Holo sya
15 チクラシー		<i>Chukurasia tabularis</i>	Yinma
16 ナンバンサイカチ		<i>Cassia fistula</i>	Ngu-shwe
17		<i>Cassia apectabilis</i>	Panamangu
18 メスキット		<i>Prosopis juliflora</i>	Gandasein
19 タナカ		<i>Limonia acidissima</i>	Thanatka
20 ビャクダン		<i>Santalum album</i>	Santagu
21 (乾燥チーク)		<i>Tectona hamiltoniana</i>	Dahat
22 トキワギリヨウ		<i>Casuarina equisetifolia</i>	Kabwi
23 イビルイビル	*	<i>Leucaena glauca</i>	Bawzagaing
24 ホウオウボク		<i>Delonix regia</i>	Seinban
25 オウゴチョウ		<i>Caesalpinia pulcherrima</i>	Seinban-gale
26 ムラサキフトモモ		<i>Syzygium cumini</i>	Thabye
27 イチジク類		<i>Ficus</i> spp	Nyaing
28 インドエルム		<i>Holoptelea integrifolia</i>	Pyaukseik
29 パサクウェ		<i>Simarouba glauca</i>	Sihabye
30		<i>Terminalia oliveri</i>	Than

具体的には、現地における個々の植栽個所の自然条件、関係村落のニーズ等に基づき植栽樹種を決定すべきと考える。すなわち乾燥の程度、土壌のアルカリ度等の自然条件を検討しつつ、農民の利用の観点か次項を考慮することが必要である。

- ①多目的樹種であること
 - ②伐期は短い方が良い(早生樹の採用)
 - ③萌芽力が大きい等更新が容易であること
- また、アグロフォレストリーを採用する場合
- ①窒素固定作用を有する

②密な樹冠を形成しない

③混系が深い

等についても考慮する。

以上のような観点、森林局における聞き込み等に基づき、今回の調査から選定した植栽候補樹種に*印を付した(*Albizzia lebekku* も有力候補であるが今回確認できなかった)。

4. 林業技術課題(乾燥地造林)

(1) プロジェクト対象地の土地利用区分等：

対象とする造林予定地、既存の人工林又は天然林について、自然条件、社会条件(集落等からの距離等)に基づいて適切な土地利用区分(傾斜地等環境保全上重要なコア区域、薪炭林区域、アグロフォレストリー区域、境界樹林帯等の区分)を行うことにより、目的に応じた森林施業を行うことは、適切な森林管理にとって必要である。特に当該土地利用区分をPRA等を用いて住民参加のもとに作成することにより、爾後の森林管理が容易になる。

またPRA等において土地利用区分毎の住民の樹木嗜好調査(Tree Preference Survey)を行い、その結果等を勘案し植栽樹種の決定を行うことは、爾後の森林管理にとって重要と考えられる。

(2) 種子採取源等の調査

チーク等の商業用樹種以外の種子の採種について、種子採種林分が明確に特定されていない。乾燥地においては、商業用樹種以外の早生樹種、郷土樹種が主たる植栽樹種である。今後乾燥地造林を進めていくにあたって、先ず良好な成長を示している林分を現地において特定し、採種林として(現地及び地図上において)確定することが必要である。

次の段階として、種子産地別の発芽率、植栽地における活着率や成長を観測しておくことが重要である。

(3) 適切な樹種選択のための土壌の簡易調査

FAO、UNESCOの世界土壌図の分類は、1/500万という小スケールで土壌単位が示されているので、この範疇で、これを造林木の成長等に対応させるには、さらに細部の分類が必要である。必要に応じ短期専門家に対応することを検討すること。

また、土壌硬度は土壌構造や土壌粒径と関係が深く、これが水分状態にも強く影響して林木根系の発達や生理生態と関連がある。また少降雨に耐える樹種でも、土壌のアルカリ度に敏感な反応を示す場合があり、土壌のpHは樹木の成育に影響を及ぼす。

簡易に測定できる土壌硬度やpHを測定することは林木の成育適否の判断に役立つことができると考えられる。

(参考)

山中式硬度計による土壌の緊密区分

緊密区分	硬度計の指示目盛(示度: mm)
しょう	0~8
軟	9~13
やや堅	14~17
堅	18~21
すこぶる堅	22~25(成育不良とみられている)
固結	26以上(成育困難とみられている)

(4) 樹下植栽試験

用材や燃料材確保以外に、中央乾燥地においては環境保全機能(水源涵養、土壌侵食の防止、緑化等)の面から森林の果たす役割が、政府、地域住民等から期待されている。ユーカリ等早生樹種の一斉単層林の環境保全機能はそれほど大きいとは考えられないので、環境保全を重視する林分においては、郷土樹種の樹下植栽等混交複層林の試行を検討する必要がある。

(5) 灌水方法等の調査

灌水は、①第1雨期が無降雨か少降雨の場合に植栽を可能とする、

②暑気(2月~5月)における枯死を防止する

ために、行われるといわれている。すでに実施されている灌水方法等について、実態調査等を行う必要がある。

—参考：プロジェクトサイトの検討—

地域住民等を対象とする社会林業的側面を有する本プロジェクトでは、講義や実験室での試験等を対象とするのみならず、実際に住民の生活が関与する現地に、技術協力の実践の場を設けることが重要である。その場合、現地において展示林(Demonstration Forest)等を設定する必要があると考えられる。

(1) 自然的・社会的条件等から成林がそれほど困難でない地域

・ Thazi Township Office 管内：

DUMD(Dry Upper Mixed Deciduous Forest)に近く自然条件が比較的良い。現在 Local Supply Plantation があり、将来村落に移管される。Minpaya Local Supply Plantation(近隣の5村を対象)を初め、他に2個所の同様の Plantation が存在すること。

・ Pyawbwe Township Office 管内：

上述と同様 DUMD に近い。管内の Kyi 村から 500 エカの Community Forest を造成したいという要望あり。また、Village Owned Plantation を 1997 年から現在までに

1,600 エーカー造成した(10 カ村が対象)とのことである。

・ Yamethin Township Office 管内：

Shuweda Thazi 村に、Local Supply Forest から移管された Community Forest(300 エーカー)がある。現在既に伐採等の利用も行っている。また、別に村の共有林もある。森林管理グループも組織化され、森林管理に取り組む意欲がみられる。

・ Tatkon Township Office 管内：

Khit-Aye 村に Community Forest があるとみられるが、村の自主的管理、CFI の村への浸透がみられない。森林局の関与が依然として強すぎるのかも知れない。

(2) 植林無償との関連にいて、植林無償の対象とする区域に近い地域

・ Nyaung-U township Office 管内

読売新聞によって植栽された 1,200 エーカー(1996～1999 年の 4 年間)のうち 900 エーカーが既に Community Forest として、Ngapai 村、Ngaminmai 村、Htabauktaw 村、Sade 村及び Htanaungwin 村に移管されている。残りの 300 エーカーは最新(1999 年)の植栽地で、現在森林局が管理している。

移管された Community Forest の伐採はまだ行われていない(Ngapai 村に移管された 1996 年植栽地のユーカリが 2001 年伐採予定)。

CFI によれば、村のユーザーグループによって、森林管理計画が策定されるはずであるが、Ngapai 村、Ngaminmai 村の調査において両村とも当該計画を所持していなかった。今後 CFI の下、村落による主体性のある管理等について指導できるのではないか。

また、当該管内で現在移管されていない森林、今後 NGO 等によって植栽予定の森林で Community Forest に移管されるものについては、当該森林管理計画を、技術協力を実施する中で森林局等を c/p として、作成することも考えられる。

(3)村落生産活動

2001年1月5日

ミャンマー中央乾燥地緑化計画短期調査帰国報告会資料

村落生産活動

1. ミャンマー国の農業関連政策の現状、農業に係る行政組織、普及体制

- 1) 98/99年度、農業はGDPシェア36%、輸出額シェア35%、労働人口シェア63%を占め、経済発展の基幹セクターとして位置付けられている。92/93年度より農業総合開発計画では、3つの開発目標：①米の余剰生産達成、②食用油の自給達成、③輸出用豆類と商品作物（綿、麻、ゴム、オイル・パーム、桑）生産の促進と、4つの政策：①生産作物選択の自由化、②農地拡大と農家の権利保護、③商品作物と多年生作物の商業生産の許可、④農業機械、その他の投入物の供給分野へのプライベート・セクターの参入奨励が掲げられている。
- 2) 中央乾燥地の農業は、ミャンマー国内でも優先度1（三段階の内最も上位）にランクされ、農業・灌漑省のミャンマー農業公社(MAS: Myanmar Agriculture Service)、および林業省によって農地保全、水源涵養等のための緑化計画、アグロ・フォレストリー開発、土壌保全活動等が実施されている。
- 3) 農業灌漑省がミャンマーの農政を担うが、省の下に5局、1公社、5国営企業、農業開発銀行、農業大学、合計13部署／機関を管轄する。農業技術の開発・普及活動は上記MASが担当機関である。

2. 村落の生産活動の実態

- 1) 中央乾燥地村落の主要生産活動は、一般的に農業であり、林業との直接的な関わりを持たないものが大部分である。その他、畜産、ジャガリー製造（砂糖やし樹液から作る砂糖菓子）、機織り等も一部に見られる。
- 2) 主要農産物は、豆類（木豆、ヒヨコ豆、大豆等）、油脂植物（落花生、ゴマ、ひまわり）、綿等が挙げられる。河川水を利用できる地域（チャンウー・タウンシップ、メッティーラ・タウンシップ、ピョウヴェ・タウンシップ等）では米作も行なわれている。畜産は羊肉、羊毛、肉牛、乳牛、養豚、山羊等が行なわれている。
- 3) なお、村の立地場所によって活動内容に差が見られる。大部分の村落が未だ純粋な農村であり殆ど農業に依存している一方で、主要街道沿いで、なお且つ乾燥の度合いが比較的低い地域の村落（ヤメツィン・タウンシッ

ブ等)では、農産物卸商、飲食店等の小規模商業も立地し、村落活動の多様化の萌芽が見られる。さらに例外的に電化が進んでいる村落(ユワジィー村、タジィー・タウンシップ)では、搾油機、脱穀・精米施設を持つ農家があり村内の農家から有料で作業を請負っている。さらに近隣の町の業者からの機織り委託生産も進めており、収入機会の多様化が進み、農村工業化の初期段階にある。

3. 村落インフラなど村落資源の現状

- 1) 土地は全て国家の所有であるが、農地は個人に耕作権が認められている。法律的にみると共有財産は無い。従って、農地の共同体管理の例は少ない(農業灌漑省 JICA 短期専門家、高橋昭雄氏による)。一方、建前と実態の違いは大きく、耕作権は本来他人に譲渡もしくは抵当権の設定などは出来ないことになっているが、実際は取引きされている。また、人口増により土地相続の際に土地の細分化、および土地無し農民を生じさせている等の問題が顕在化している。
- 2) なお、近年コミュニティ・フォーレストとして植林された土地は、耕作放棄地等条件の悪い土地が多く、その後の管理を難しくしている面がある。
- 3) 水はポンプ式深井戸、溜め池等を利用するのが一般的である。例外的に村内に十分にポンプ汲上式深井戸を持つ村落もあるが、通常は水運搬(牛車、人力)、水質の悪さ等に苦勞しており、多くの村落で「飲料水/農業用水」の開発ニーズは優先度が高い。
- 4) 電気は自家発電(夜間2~3時間)の村落が多く、それも全世帯に行き渡っている訳ではない。農村機械化、工業化進展の大きな制約である。
- 5) 交通手段は、牛車、自転車、バイクが中心で、トラック等の車両は村落で1、2台というところが多い。また村落道路も無舗装であり、雨季は乾季に比べ道路条件は相当悪化することが予想される。

4. 村落資源に対する農民、村落組織による利用・管理の実態

- 1) 水は世帯当たりの一日本取水量の制限を設けて利用している例が多い。
- 2) 昔から村に伝わる精霊の森管理(ズィオ村、チャウパダン・タウンシップ)の例では、4人の管理グループを作り、その指揮の下で「精霊の宿る木は絶対に切らない、また他の木が切られたり、動物の食害にさらされないよう」に監視、見回りを行っている。
- 3) 土地を含む村落資源の共同体管理の事例は一般的に少ないと言われるが、それは管理能力の欠如を意味するものではない。井戸など、村落住民にとって重要度の高い資源・資産の管理は適切に行なわれている例が多いとの

指摘がある（前述、高橋氏）。

5. 中央乾燥地の村落での所得向上の可能性とその具体的手法

- 1) 村落の所得向上を計画課題の一つとして組み込んだ中央乾燥地地域開発マスタープランが基本的には必要。都市部の産業振興（観光、商業、製造業振興による地域経済拠点の強化、農村部余剰労働力の雇用吸収力の拡大）、そのための道路、通信、電気、水等の産業・生活インフラの整備（都市部と開発拠点村落対象）、都市部と農村部の機能的連携の強化、中央乾燥地地域経済圏の地域内連携強化等、地域経済全体を強化するフレームが欠かせない。
- 2) 村落内では農業の生産性向上、生産の拡大、市場動向（需要、価格等）に応じた生産計画、農業技術の向上、農村工業化のための基盤整備促進（道路、水道、電気、通信等のインフラ）、村落内雇用機会の拡大、マイクロ・クレジットスキームによる村落生産活動支援等を通じた所得向上と生活環境整備が課題である。マルチ・セクトラル・アプローチが求められる。

6. 村落資源管理方法の改善の可能性とその具体的手法

- 1) 森林保全、造林は、①薪炭・建材等の供給、②土壌保全、③水源涵養の点から見て、上記所得向上の基礎的条件整備の重要な要素である。しかし、その重要性、緊急性は村落住民によって必ずしも十分に認識されていない。
- 2) 森林保全、造林が、土壌保全および薪炭材の供給につながり、結果として農業生産性向上の重要な条件であり、村落民の社会経済的便益に深く関わっていることの認識を深めることが必要不可欠である。

そのためには、森林局、乾燥地緑化局の普及活動の重点項目として、森林保全、造林の村落民にとっての有用性を、具体的事例等（デモンストレーション・フォレスト、開発モデル村等の活用）を通して認識させる普及活動が求められる。特に、コミュニティ・サプライ・フォレストの拡大と住民移管の促進が必要と考えられる。

また、マルチ・セクトラルな村落開発アプローチの中に緑化計画を的確に位置付け、MAS の普及活動、UNDP/FAO プロジェクト「Environmentally Sustainable Food Security and Micro-income Opportunities in the Dry Zone」との連携等も考慮した普及活動を展開するのが効果的である。

- 3) NGO の活用と連携（例、OISCA の農業技術指導では、乾燥地農業の技術指導－栽培技術、有機農法、地下水の水質改善実験等－による生産性向上に一定の成果を挙げている）

(4)計画分析／社会調査

中央乾燥地緑化計画

北尾理恵（計画分析/社会調査）

1. 村落レベルでの社会制度調査

(1)土地所有制度

ミャンマー国の土地所有権は国家に属し、国民にはその使用权のみが与えられている。土地を抵当に入れることや売買は表向き禁止されているが、実際には現場レベルで行われている。森林に関しては、Reserved Forest（保全林）と Protected Public Forest（保護林）における土地と樹木は森林局の管轄である。一方、Unclassified Forestの土地は森林局の管轄でないが樹木は管轄下にある。この調整は Local rule に則り、division レベルで行われる。

(2)小作制度

土地の貸借は認められていないが、古くからの慣習として残っている。ただし、天候不順時のリスクが大きいため、土地無し農民は日雇い労働者として日給をもらうというシステムをとる場合が多い。

(3)共有地制度

コミュニティフォレスト（CF）を持つ村では、主に村長によって管理グループが組織されており、山火事、不法伐採の見張りなどを行っている。森林の管理は村内の管理グループに任されており、村民への聞き取りで「管理グループがやっているから自分とはあまり関係ない」という意識が感じられた。ユーザーズグループも村の一部の世帯のみから成り、このグループ以外の世帯の利用は認められない。また、CF 伐採の際には森林局の許可が必要であり、これも「自分たちの森林」という認識が低い原因となっている可能性がある。

(4)村落の行政機構

村長の下に2, 3人の副村長（予備がいることもある）がおり、さらにこの下に、グループ長（約10人あるいは約10世帯から1人選ばれた）が10名前後存在し、彼らによって村の運営が行われている（メンバーは全て男性）。村長は村人全体での話し合いによって選出されている。

2. 住民ニーズ調査

ニーズとして、村落インフラ整備、雇用の拡大、産業の振興、燃料の確保等が挙げられる。

(1)村落インフラ整備

村民は「村の課題」として、水、電気、道路、学校、病院等の村落インフラ整備をあげている。飲料水と家庭での電気の普及は、水くみ労働時間の減少など生活環境を改善させ、灌漑水の確保は農業生産性の向上、収入増へつながる。また、電気の投入、道路整備は織物生産、農産加工等における生産効率、販売効率を飛躍的に向上させ収入増へと結びつくものである。村民は生活環境と収入向上の両面から村落インフラを最重要視している。

(2)雇用の拡大と産業の振興

乾燥地の村落では土地無し農民の比率が高い。彼らは主に他人の畑で日給労働者（100チャット前後/日）として働いており低収入に甘んじている。特に、土地を相続する見込み

のない土地無し農民は出稼ぎ以外に主な収入の道がなく、雇用創出が極めて重要である。

たとえば、農業外産業（ジャガリー、織物生産など）の振興により雇用を拡大することが考えられる。これらの産業が確立されている村では、技術レベルの向上、設備投資により高品質、高価格製品を生産し収入増をめざしたいと考えており、これにうまく土地無し農民を労働者として取り込めばさらなる生産量増加、収入増、雇用創出につながる。また、天候に左右されず広い土地が不要な家畜生産を導入・振興することも考えられる。

(3)燃料（まき）の確保

住民は「まきが不足している」「燃料に豆の茎や初殻を利用している」と答え、薪炭林の需要は大きいと考えられるが、ニーズとしての優先順位は低い。この理由として、まきが多少不足しても①遠方までまきを取りに行く、②まき以外の燃料（牛糞、豆の殻、茎）を利用する、③人から分けてもらう、等が現段階では可能であるためと考えられる。

今後、CFの活用がうまく促進されないまま森林の減少とまきの需要量が進行すると、次のように住民の生活への影響が生じると考えられる。

- 1) 所有地を持たない（fence forestがない）農民は、これまで親戚からまきを分けてもらうことによりまきを得ていたが、これが困難になる。したがって、①さらに遠方までまきを取りに行く、②他人の土地から勝手にとる、③まき以外の燃料（牛糞、豆の殻、茎）を利用する可能性がある。
- 2) ジャガリー生産、揚げ菓子生産などを行っているグループ・家庭、土地を持つ一般家庭で十分なまきを入手できなくなり、1)と同様の傾向をたどる。この結果、作業効率が低下し、生産量減少すなわち収入減につながる。また、家庭での主婦の料理、まき集めなどの作業量が増加する。

したがって、森林保全による燃料の確保は村落ニーズとしてのプライオリティは低いものの、長期的な視点から村落インフラと同様、重要性は高い。同時に改良かまど使用の推進も必要である。また、土壌保全技術の普及も森林保全、土壌生産性向上の面から重要な意義を持つ。

中央乾燥地においては上記のニーズを統合した取り組みが必要となろう。FAO、UNDP、DAP等も中央乾燥地においては、マイクロファイナンスの導入、農業・農産加工技術の導入、土壌保全技術の普及など総合的な分野を統合したプロジェクトが効果的であるとしている。

3.PCM ワークショップ

中央乾燥地における問題を明らかにし、農業省、森林省それぞれの立場での問題の捉え方について情報を得るためワークショップを実施した。また、今回は参加者分析、プロジェクトの選択、PDMの作成は今回行わず、問題分析、目的分析のみ実施した。

(1) 問題分析

まず、参加者全員に中央乾燥地に係る問題をカードでリストアップしてもらった。その後、カードを普及、水資源、土壌、農業など分野別に区分しツリーに整理した上で、このツリーを結合して全体のproblem treeを作成した。problem treeでは農業収量の低さ、インフラの未整備、人口増加、雇用機会の不足により乾燥地住民の貧困が発生していることが示

されている。

(2)目的分析

problem tree を望ましい状況に言い換えるという形式で **objective tree** を作成した。森林を持続的に管理するために何を投入すべきかという点に対しては、普及活動サービスの向上が重要という認識のもと多くの意見が出され、活発な議論が繰り広げられた。

JICA