FOREST FIRE PREVENTION FOR NON GOVERNMENT ORGANIZATIONS

SUMMARY OF TRAINING MODULE

ITTO PROJECT PD 89/90 (F) PHASE III
HUMAN RESOURCES DEVELOPMENT

DEPARTEMEN KEHUTANAN

CENTER FOR FORESTRY EDUCATION AND TRAINING
MINISTRY OF FORESTRY, REPUBLIC OF INDONESIA
INTERNATIONAL TROPICAL TIMBER ORGANIZATION

FOREST FIRE PREVENTION FOR NON GOVERNMENT ORGANIZATIONS

SUMMARY OF TRAINING MODULE

ITTO PROJECT PD 89/90 (F) PHASE III
HUMAN RESOURCES DEVELOPMENT

DEPARTEMEN KEHUTANAN

CENTER FOR FORESTRY EDUCATION AND TRAINING
MINISTRY OF FORESTRY, REPUBLIC OF INDONESIA
INTERNATIONAL TROPICAL TIMBER ORGANIZATION

Forest Fire Prevention for Government Organizations

Summarized on the Basis of the work of:
Sudayatna
Sudibyo

Summarized by:
Rufi'ie

Editor:
Edi Purwanto

Training Module
Forest Fire Prevention for Non Government Organizations

Summary

This document is the summarized version of Forest Fire Prevention Training Module for Non Government Organization. The original version is published in Indonesian as one of the results of the cooperation between the Center for Forestry Education and Training (CFET), Ministry of Forestry, Republic of Indonesia and the International Tropical Timber Organization (ITTO) through ITTO Project PD 89/90 (F).

The first chapter introduces the background, objectives, target groups, methods, teaching equipments and materials, and curriculum.

The objectives of this training are: (1) To equip the participants with knowledge and skill in land and forest fire prevention as guidance in community development, and (2) To raise sense of responsibility of the participants in order to increase awareness in the efforts on Forest Fire Prevention.

The target groups of this training are Non Government Organizations committed in environmental issues and active in empowerment of community surrounding forest.

Chapter two explains theoretical subjects delivered in the training course:
(1) Introduction to the Course/Climate Setting.
(2) Policies on Forest Management and Forest Fire Prevention.
(3) Basic Principle of Forest Fire.

(4) Efforts in Forest Fire Prevention.

(5) Methods and Tools for Community Facilitation.

Chapter three covers the following subjects related to exercise or fieldwork activities:

(1) Evaluation of Formation and Development of Community Groups.

(2) Development of Methods and Tools for Community Facilitation.

(3) Development of Action Plan for Community Facilitation in Land and Forest Fire Prevention.

This module needs to be further elaborated and modified to meet recent development or local specific environment.

FOREST FIRE PREVENTION
FOR NON GOVERNMENT ORGANIZATIONS

TABLE OF CONTENTS

CHAPTER I. INTRODUCTION

1.1. Background

Forest fire in Indonesia, because of their frequency and severity during the last two decades; have emerged on the global agenda as a major problem needing urgent and continuous attention.

Most forests in Indonesia are categorized as tropical rain forests, since the country is located in the tropics where there is plentiful rainfall. This provides conditions, which are favorable for many organisms to live, all of which have contributed to making Indonesia as the mega diversity country. The majority of many elements of this biodiversity are found in the natural rain forests of Borneo (Kalimantan), Sumatra and Papua.

Large areas of land and forest in Indonesia burned in 1982 and 1983. In Kalimantan alone, the fires burned from 2.4 to 3.6 million ha of forest. Land and forest also burned in Indonesia during extended dry periods in 1987, 1991, and 1994 and most recently in 1997-1998. Various estimates of total area burned during the most recent fires range from hundreds of thousands to millions of hectares.

In the late 1997 and early 1998, devastating forest fires in several locations in Indonesia alerted the Southeast Asian region to the urgency of the need to find effective solutions to a recurring social and environmental problem with local, regional and global consequences. Human health was disturbed due to very thick haze spreading to the neighboring countries, causing in some instances to panic because it has gone the tolerable limit. Major modes of transportation were hampered-many flights were grounded, sea and river transport bore the high risk of accidents, and so were the many means of land transportation. Of no less importance was the loss of

valuable timber from the lush tropical forests, the lowering quality of animal and plant habitat and the loss of gene pool and biodiversity.

The causes of forest fires can be grouped into two categories-prediscoping (creating conditions favorable for fires) and immediate (leading to ignition). Both these can be natural or man-made; and they reinforce each other. El Nino Southern Oscillation (ENSO) phenomenon is a natural prediscoping factor, whereas man-made factors are: wasteful logging, forest clearance for agricultural crops, estate crops and forest plantations leading to build up of combustible materials; in adequate fire protection measures etc.

Looking to the future, ENSO will continue to occur. Also land use patterns will continue to fragment Indonesia's forested landscape, producing more and varied fuels for fire. As such, forest fire prevention should be undertaken as a joint effort of all concerned. It is widely realized that prevention is one of the most effective ways to tackle forests and land fires. If we can lessen the possibilities of fire incidents, it would reduce efforts of suppression and rehabilitation. However, forest fire is a weak area in Indonesia. Efforts to prevent forest fires call for stakeholder actions to control the causes of fire. Knowledge about, and analysis of, causes, both prediscoping and immediate, of forest fires is important to design and implement measures of fire protection.

To enhance both theory and practical skill of all related parties on forest fire prevention, Center for Forestry Education and Training (CFET[1])-Ministry of Forestry of the Republic of Indonesia in cooperation with the International Tropical Timber Organization

---

[1] CFET has the duties to carry out education and training for forestry officials within the Indonesian Ministry of Forestry and other institutions related to forestry development. In implementing its duties CFET carries out the following fuctions: (1) To carry out the policies of the Ministry in education and training (2) To formulate the plan, programs, evaluation and reports (3) To study and develop education and training (4) To serve, supervise and coordinate educational amd training activities (5) To manage the Center's administration.

[ITTO Project PD 89/90 (F)] have identified, developed and successfully tried-out[2] of seven training modules for seven target groups; *(1)* extension workers *(2)* trainers *(3)* middle-managers of forest concession holders *(4)* middle-managers of government officials on district level *(5)* local community *(6)* forest guards and *(7)* non-government organizations. All those seven training modules were written in Indonesian.

In order to reach the wider readers and to enable to support similar activities in South East Asia, three [(1), (5) and (7)] of those seven training modules were summarized and translated in English.

This document is the summarized version of **Forest Fire Prevention Training Module for Community**. On the original version of the module, each module is composed of four chapters; *(1)* Introduction *(2)* Guide for Module's User *(3)* Curriculum and Syllabus *(4)* Training Manual. Chapter One to Chapter Three acts as introductory chapters, while the core of the module lies on Chapter Four. The latter chapter gives a comprehensive guidance to the trainers/tutors/ facilitators on both **Theory** (class-room session) and Fieldwork (practical exercises). The level of guidance is given on a training subject basis, which are composed of **Tutor Note** (rough session scenario) and several hand-outs for participants. As such, tutors have to prepare **Trainer's Agenda/Session Planning** by themselves.

It must be kept in mind that this module only contains minimum set of training material, thereby further elaboration, modification are required to meet recent development or local specific environment.

---

2 The main idea of training try-outs is to evaluate or test the initial draft of the newly developed module in the field. By testing the modules, it could be found several inconsistencies, irrelevant material, impractical exercises, insufficient time allocation etc. Those things will be bases to improve the modules.

1.2. Overall Objectives of the Training Course

1.2.1. General Objectives

1. To equip the participants with knowledge and skill in land and forest fire prevention as guidance in community development.

2. To raise sense of responsibility of the participants in order to increase awareness in the efforts of forest fire prevention

1.2.2. Immediate Objectives

(1) After completing the training course the participants are expected to obtain basic knowledge and skill on forest fire prevention.

(2) The participants are expected to have awareness to develop a community group to conduct participative efforts on forest fire prevention in their area.

1.3. Target Groups

Non Government Organizations committed in environmental issues and active in empowerment of community surrounding forest.

1.4. Methods

The training module is not designed like a medicine or a cookbook; it is open for creativity of trainers/facilitators/training organizers. As such, further elaboration, modification or adaptation is required to meet recent development, level of participants (experience, education) or local specific environments.

Training implementation, as much as possible, built upon the experiences of the participants. Training session give facilitation of the learning and sharing from participant to participant (cross-fertilization), rather than just one-way communication from facilitator to participants. Participants should be actively involved in all phases

of the learning process through group activities (discussion, self-learning, group work, presentation, seminar, exercise, etc.). In this context, role of training facilitators[3] are central, they should have capability: *(1)* to give opportunity to participants to take part in all activities *(2)* to encourage the participants to be active, "force" them if needed *(3)* to improve the capability of the participants to be active through examples, stimulation, etc.

1.5. Teaching Equipment and Material

(1) White board, OHP and slide, chart, poster, leaflet, board marker

(2) Hand out, pen/pencil, notebook

(3) Field work manual, compass, measuring tape, spade, pen/pencil, paper

1.6. Curriculum

No.	Subject	Allocated Time (@ 45 min)
A	Theory	(40)
1.	Introduction to the Course/Climate Setting	6
2.	Policies on Forest Management and Forest Fire Prevention	6
3.	Basic Principle of Forest Fire	6
4.	Identification and Mapping of Forest Fire-sensitive Areas	6
5.	Methods and Tools for Community Facilitation	16
B.	Exercise/Fieldwork	(60)

---

[3] A good facilitator should: *be patient, Listen and do not dominate the discussion, be appreciative, always learn, be equal, do not "teach", be wise, do not judge, do not criticize, open, positive thingking.*

1.	Evaluation of Formation and Development of Community Group	20
2.	Development of Methods and Tools for Community Facilitation	20
3.	Development of Action Plan for Community Facilitation in Land and Forest Fire Prevention	20
	Total	**100**

CHAPTER II. THEORY

2.1. Climate Setting

> **Objective:** To create a favorable situation (climate setting) for the participants and the facilitator to start the training
>
> **Methods:** - Introduction among the participants and the facilitator
> - Group dynamic games
>
> **Allocated Time:** 4 x 45 minute divided into two sessions
> - Ice Breaking
> - Introduction to the course

2.1.1. Ice Breaking

This session aims to set up a relaxing and helpful situation in knowing each others (among the course mate) by using games. There are a lot of games available especially used for this session.

2.1.2. Introduction to the Training Course

This session give an overview on the background and objectives of the course, schedule and other related matters.

2.2. Policy on Forest Management and Forest Fire Prevention

> **Objective:** To introduce participants to policy on forest management and forest fire prevention.
>
> **Methods:**   - Lecture
> - Discussion
>
> **Allocated time:** 4 x 45 minute divided into two sessions
> - Policy on Forest Management
> - Policy on Forest Fire Prevention

2.2.1. Policy on Forest Management

This session aims to strengthen the idea of functions of forest, objective of forest utilization and policy on forest management. This will include; government policies on forest management and forest fire prevention, especially related to forest management policy in participant's area, for examples Protection Forest, Production Forest, Nature Conservation, etc. Therefore, forestry official responsible for forestry policy better delivers this subject.

The steps of subject delivery are as follow:

(1) Facilitator starts the session by delivering subject on function and benefit of forest for human life. Use a chart or poster or cartoon showing the multi-use of forest.

(2) Discuss the subject with the participants.

(3) Review the discussion by delivering in-depth explanation on function and benefit of forest for human life:

- Conservation and protection: land conservation, hydrology, preservation of gene-resources

- Production/economic: forest products (timber, firewood, rattan, medicinal plants, etc.)

- Social: recreation, places for indigenous people,

- Ecological: supply of water, prevention of landslides and erosion, and biodiversity

(4) Discuss also the division of function of forest based on the Government Laws and Regulations (Government Policies), e.g. Conservation Forest, Protection Forest and Production Forest.

2.2.2. Policy on Forest Fire Prevention

The purpose of this session is to discuss the importance of forest

protection and forest fire prevention (FFP), principles of FFP and policy on FFP.

(1) The essence of forest fire prevention

   a. Overcoming forest fire is obligation of all stakeholders related to forestry activities.

   b. The activities are emphasized in pre-fire activities: prevention, monitoring, awareness and readiness to decrease or lessen the impact caused by forest fire.

(2) Principles of FFP

   a. Principle of togetherness and voluntary

   b. Principle of coordination, synchronization, and integration

   c. Principle of autonomy/self-funding

   d. Principle of promptness and accuracy

   e. Principle of prevention and preparedness

   f. Principle of totality

   g. Principle of global

(3) The direction of policies

   Often forest fire becomes large and difficult to handle although in-conventional equipment are available. In order to implement forest fire prevention in line with sustainable forest management, the activities are directed:

   a. To prevent impact and losses caused by larger fires.

   b. To safe human life, government assets.

   c. To manage impacts after fires.

(4) Vision and Mission

    a. Vision

    To control forest fire and to protect people from damages caused by forest fire.

    b. Mission
- To optimize the aspect of forest fire prevention
- To improve monitoring, alertness and readiness
- To improve aspect of rehabilitation of forest after fire
- To enhance judicial aspect

(5) Targets of forest fire prevention

    a. To master technology of prevention, monitoring, alertness, readiness, early warning system, early detection, early fire extinguishing, and post-fire handling.

    b. To utilize all potential resources to overcome forest fire nationally supported by appropriate software and hardware.

    c. To improve coordination and cooperation nationally, regionally and internationally.

(6) Normative steps of FFP

Steps of forest fire include: prevention, monitoring, preparedness, early warning, early detection, respond, and post fire management.

The chart below shows the steps/cycle of forest fire prevention.

Alert level III	
	1. Prevention

Alert level III

```
Alert level III ┌─────────────────────────┐
                │  ┌──────────────────┐   │
                │  │  1. Prevention   ◄──┐ │
─ ─ ─ ─ ─ ─ ─ ─ ┼──┴────────┬─────────┘──┼─ ─ ─ ─
                │  ┌─────────▼────────┐   │
                │  │ 2. Monitoring,   │   │    ┌──────────────┐
                │  │ Alertness and    │   │    │ Preparedness │
Alert Level II  │  │ Preparedness     │   │    │    Step      │
                │  └─────────┬────────┘   │    └──────────────┘
                │  ┌─────────▼────────┐   │
                │  │ 3. Early Warning │   │
─ ─ ─ ─ ─ ─ ─ ─ ┼──┴────────┬─────────┘──┼─ ─ ─ ─
                │  ┌─────────▼────────┐   │
                │  │ 4. Early Detection│  │
                │  └─────────┬────────┘   │    ┌──────────────┐
                │  ┌─────────▼────────┐   │    │ Respond Step │
Alert Level I   │  │   Pre-Attack     │   │    └──────────────┘
                │  │ 5. Initial Attack│   │
                │  │   Mobilization   │   │
─ ─ ─ ─ ─ ─ ─ ─ ┼──┴────────┬─────────┘──┼─ ─ ─ ─
                │  ┌────────▼─────────┐   │
Alert level III │  │6. Post-fire      ├───┘
                │  │  Management      │
                └──┴──────────────────┘
```
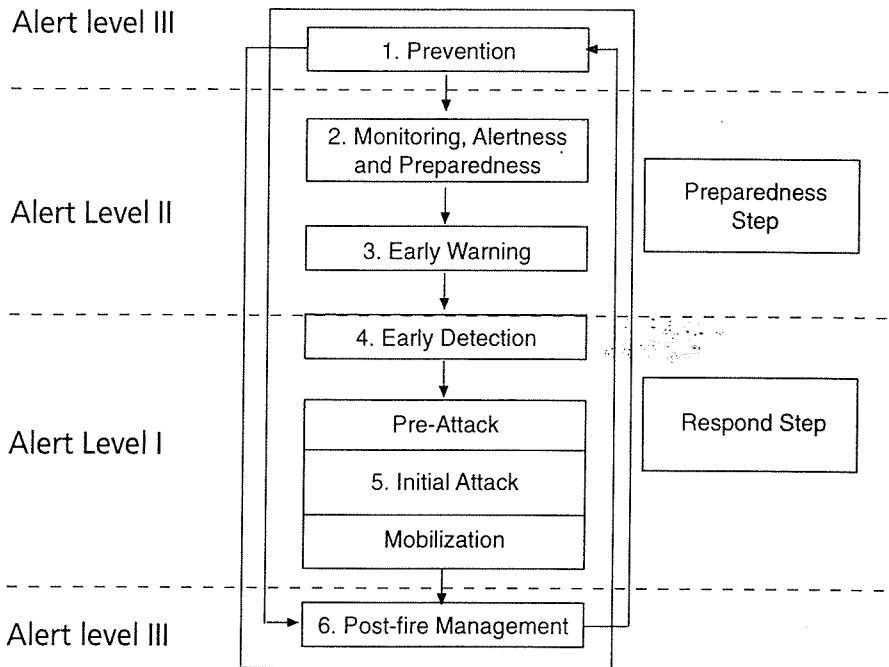
Explanation:

(1). Prevention:

    a. Social, cultural and economic approaches
The purpose is to enhance people awareness on forest fire danger. The activities include campaigns through TV shows, TV and radio talks, newspaper, demonstrations, etc., and community-based forest fire management.

    b. Fire prevention techniques approaches
These include man-made green belt, natural break, fuels break, firebreak, controlled burning.

    c. Forestry techniques approach
    - Discipline in forestry knowledge implementation

- Development of fire-resistant infrastructures such as roads and water supply system.
- Selection of species in plantation and silvicultural techniques in natural forest.

d. Implementation

All stakeholders have obligation to participate in management of forest fires.

(2) Monitoring, Alertness and Preparedness

In dry season, monitoring of all aspects related to danger rating prediction and forest fire management should be done. Alertness is created by posting guard in fire tower and intensifying patrolling.

Preparedness is a step to prepare all resources by all stakeholders in managing forest fire before fire season.

The chart below explains steps of monitoring, alertness and preparedness.

```
            ┌─────────────────────────────┐
            │ MONITORING, ALERTNESS AND   │
            │       PREPAREDNESS          │
            └─────────────────────────────┘
                          │
            ┌─────────────────────────────┐
    ┌───────│     NEEDS IDENTIFICATION    │───────┐
    │       └─────────────────────────────┘       │
    │                    │                         │
┌─────────┐  ┌────────────────────┐  ┌──────────────────────┐
│MONITORING│  │ GUARDING, MONITORING│  │ CONSOLIDATE STANDARD │
│RESOURCES│  │    & PATROLLING     │  │ OPERATION PROCEDURE  │
└─────────┘  └────────────────────┘  └──────────────────────┘
    │                    │                         │
    └──────│    TRAINING/SIMULATION     │──────────┘
           └────────────────────────────┘
                        │
           ┌────────────────────────────┐
           │   NEW RESOURCES DATABASE    │
           └────────────────────────────┘
                        │
           ┌────────────────────────────┐
           │ TASK PLAN AND MOBILIZATION  │
           └────────────────────────────┘
```
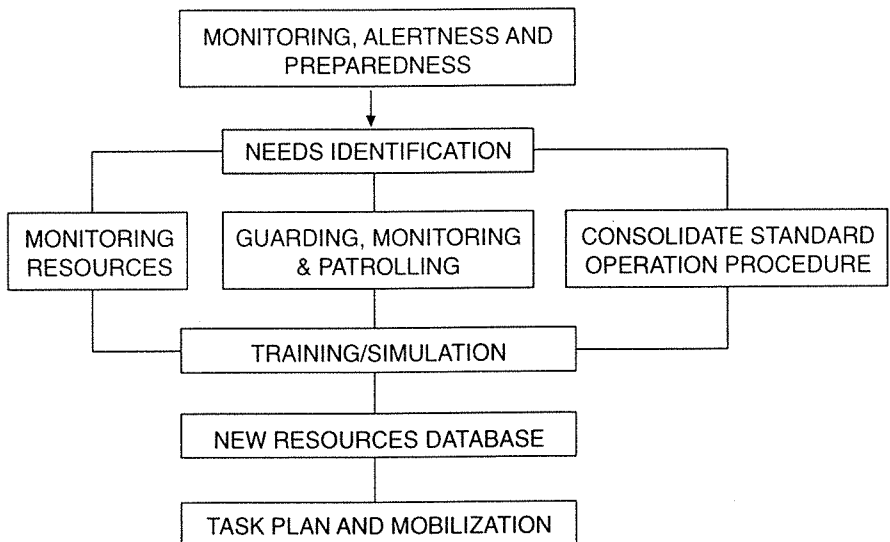
(3) Early warning and detection systems

Early warning is a determination of condition from an analysis of factors influencing an area fire danger status. This consists of early warning and early detection

Early warning consists of daily examination of map of forest fire-sensitive areas, analysis of weather, fuels and community dynamic, analysis of dryness index, warning signs, and coordination among stakeholders.

```
                    ┌─────────────────────────┐
                    │  EARLY WARNING SYSTEM   │
                    └─────────────────────────┘
        ┌───────────────────────┬───────────────────────┐
┌──────────────────┐  ┌──────────────────┐  ┌──────────────────┐
│ ANALYSIS OF      │  │ ANALYSIS OF DAILY│  │ ANALYSIS OF OTHER│
│ WEATHER & GLOBAL │  │ DRYNESS INDEX    │  │ IMPORTANT FACTORS│
│ CLIMATE          │  │                  │  │ IN THE FIELD     │
└──────────────────┘  └──────────────────┘  └──────────────────┘
                    ┌─────────────────────────┐
                    │ ANALYSIS OF DANGER      │
                    │ STATUS THROUGH DANGER   │
                    │ MAP                     │
                    └─────────────────────────┘
                    ┌─────────────────────────┐
                    │ FOREST-FIRE-DANGER      │
                    │ STATUS                  │
                    └─────────────────────────┘
                    ┌─────────────────────────┐
                    │ DISSEMINATION OF        │
                    │ INFORMATION             │
                    └─────────────────────────┘
                    ┌─────────────────────────────────────┐
                    │ DECISION MAKING:                    │
                    │ • Change the status sign            │
                    │ • Increase the frequency of patrolling│
                    │ • Relocate the resources to the location│
                    │ • Coordination                      │
                    │ • Activation of guard posts         │
                    └─────────────────────────────────────┘
```
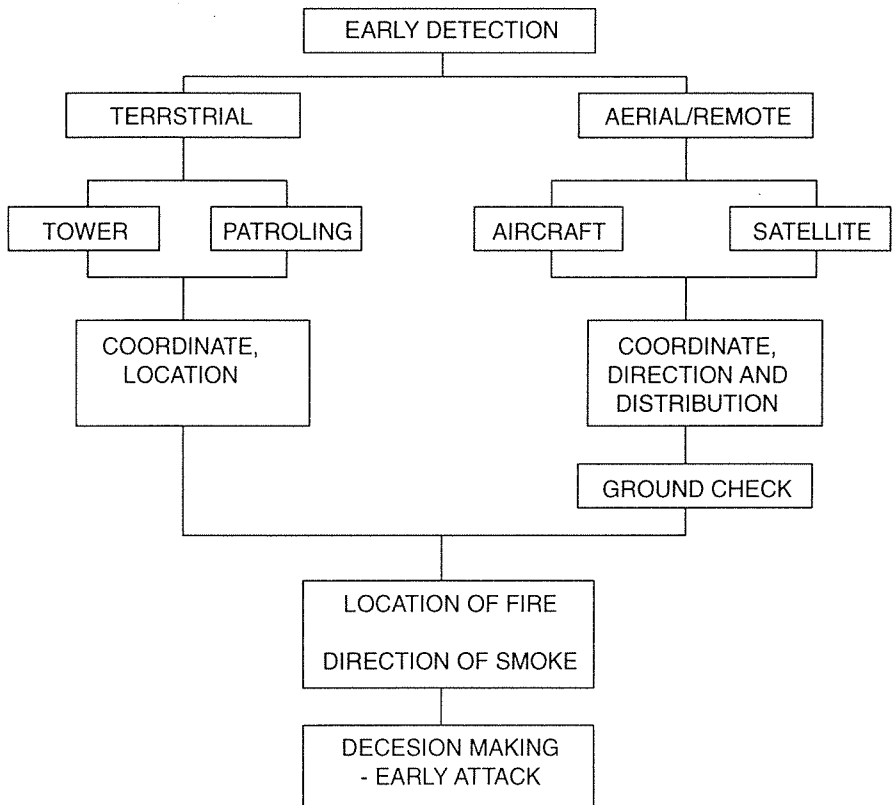
Early detection is an effort to obtain information of forest fire as early as possible through a simple to sophisticated technology.

This composes of terrestrial detection and aerial or remote sensing. Terrestrial detection is done through patrolling in sensitive areas; tower examination while aerial sensing is done through the use of helicopter, aircraft and satellite.
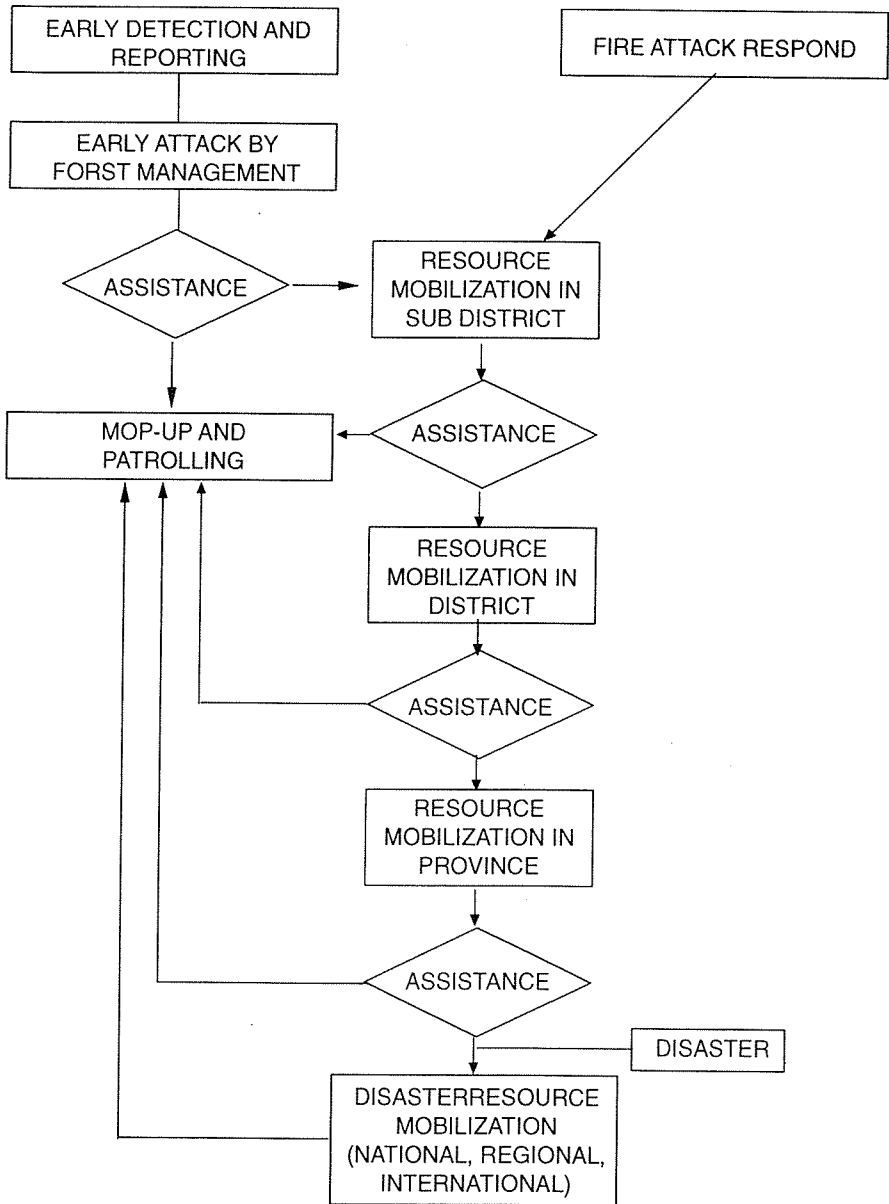
Mechanism:

```
                    ┌─────────────────────┐
                    │   EARLY DETECTION   │
                    └─────────────────────┘
          ┌───────────────────┐       ┌───────────────────┐
          │    TERRSTRIAL     │       │   AERIAL/REMOTE   │
          └───────────────────┘       └───────────────────┘
      ┌──────────┐  ┌─────────────┐  ┌────────────┐  ┌────────────┐
      │  TOWER   │  │  PATROLING  │  │  AIRCRAFT  │  │  SATELLITE │
      └──────────┘  └─────────────┘  └────────────┘  └────────────┘
         ┌────────────────────┐        ┌────────────────────┐
         │    COORDINATE,     │        │    COORDINATE,     │
         │     LOCATION       │        │   DIRECTION AND    │
         │                    │        │   DISTRIBUTION     │
         └────────────────────┘        └────────────────────┘
                                       ┌────────────────────┐
                                       │   GROUND CHECK     │
                                       └────────────────────┘
                        ┌────────────────────┐
                        │  LOCATION OF FIRE  │
                        │                    │
                        │ DIRECTION OF SMOKE │
                        └────────────────────┘
                        ┌────────────────────┐
                        │  DECESION MAKING   │
                        │   - EARLY ATTACK   │
                        └────────────────────┘
```

(4) Fire Attack

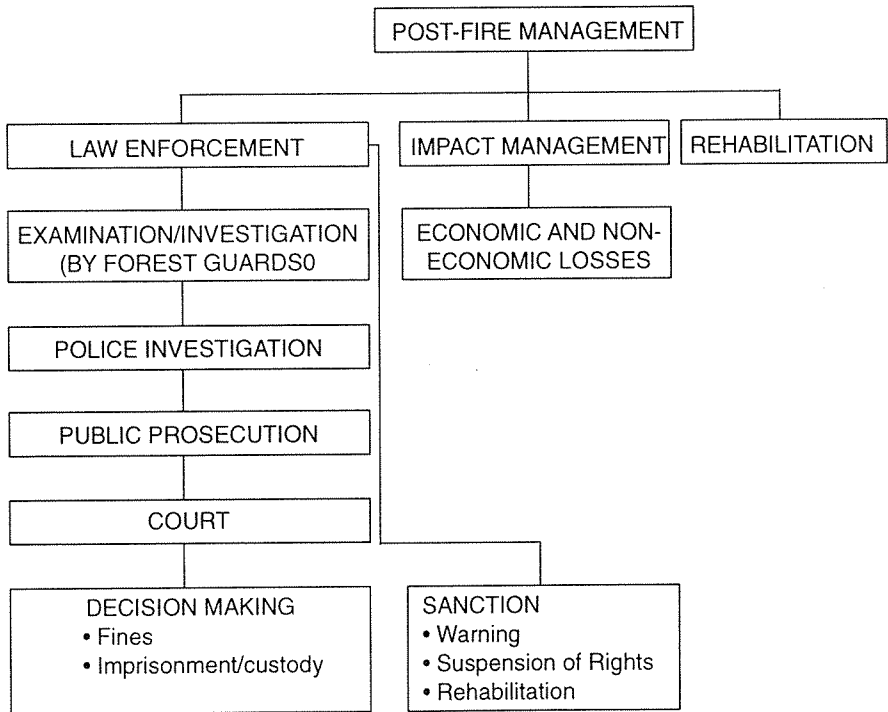Fire attack is an activity to extinguish fire starting from planning to mop-up and patrolling.

Mechanism:

```
┌─────────────────────────┐          ┌──────────────────────────┐
│  EARLY DETECTION AND     │          │   FIRE ATTACK RESPOND    │
│      REPORTING           │          └──────────────────────────┘
└─────────────────────────┘
           │
┌─────────────────────────┐
│    EARLY ATTACK BY       │
│   FORST MANAGEMENT       │
└─────────────────────────┘
           │
        ◇ ASSISTANCE ◇ ──────────→ ┌──────────────────────────┐
           │                        │  RESOURCE MOBILIZATION   │
           ↓                        │      IN SUB DISTRICT     │
┌─────────────────────────┐         └──────────────────────────┘
│   MOP-UP AND            │ ←──── ◇ ASSISTANCE ◇
│    PATROLLING           │              │
└─────────────────────────┘              ↓
                                ┌──────────────────────────┐
                                │  RESOURCE MOBILIZATION   │
                                │       IN DISTRICT        │
                                └──────────────────────────┘
                                         │
                                 ◇ ASSISTANCE ◇
                                         │
                                ┌──────────────────────────┐
                                │  RESOURCE MOBILIZATION   │
                                │       IN PROVINCE        │
                                └──────────────────────────┘
                                         │
                                 ◇ ASSISTANCE ◇
                                         │         ┌─────────────┐
                                         │ ←────── │   DISASTER  │
                                         ↓         └─────────────┘
                                ┌──────────────────────────┐
                                │   DISASTERRESOURCE        │
                                │     MOBILIZATION          │
                                │ (NATIONAL, REGIONAL,      │
                                │   INTERNATIONAL)          │
                                └──────────────────────────┘
```

(5) Post-fire management

Post-fire management consists of activities conducted during the fires, after fires inactive and during the former fire sites still recognizable.

The activities included are fire cause investigation, fire impact management, law enforcement, and rehabilitation.

Mechanism:

```
                    ┌─────────────────────────┐
                    │  POST-FIRE MANAGEMENT   │
                    └─────────────────────────┘

┌──────────────────────┐  ┌──────────────────────┐ ┌──────────────────┐
│   LAW ENFORCEMENT    │  │  IMPACT MANAGEMENT   │ │  REHABILITATION  │
└──────────────────────┘  └──────────────────────┘ └──────────────────┘

┌──────────────────────────┐  ┌──────────────────────┐
│ EXAMINATION/INVESTIGATION │  │   ECONOMIC AND NON-  │
│    (BY FOREST GUARDS0     │  │   ECONOMIC LOSSES    │
└──────────────────────────┘  └──────────────────────┘

┌──────────────────────────┐
│   POLICE INVESTIGATION    │
└──────────────────────────┘

┌──────────────────────────┐
│    PUBLIC PROSECUTION     │
└──────────────────────────┘

┌──────────────────────────┐
│          COURT            │
└──────────────────────────┘

┌──────────────────────────┐  ┌──────────────────────────┐
│     DECISION MAKING       │  │        SANCTION          │
│     • Fines               │  │     • Warning            │
│     • Imprisonment/custody│  │     • Suspension of Rights│
│                           │  │     • Rehabilitation     │
└──────────────────────────┘  └──────────────────────────┘
```

2.3. Basic Principle of Forest Fire

Objective: To introduce the participants to the Basic Principle of Forest Fire (factors affecting forest fires, causes and impacts of forest fires)

Methods: - Lecture
- Discussion

Allocated time: 6 x 45 minute divided into three sessions:
      b. Cases of Forest and Land Fires
      c. Concept of Fire Triangle
      d. Causes and Impacts of Forest Fires
      e. Intensity of fire spread and types of forest fires

2.3.1. Cases of Forest and Land Fires

In this session the participants are divided into small groups (@ 5 persons) and asked to discuss causes and impacts of forest and land fires. Topics to discuss can be:

Group 1:

    a. The causes of forest fires.

    b. How to open and clear lands (Give an example on a careless way to clear land).

    c. Compare the example with the practice in participant area's common practices.

Group 2:

    a. The impacts of forest fires.

    b. Who are affected by the fires and who should be responsible?

    c. How if forest fire occurs in your area? What should community in your area do?

2.3.2. Concept of Fire Triangle

Three main causes of forest fires:

    a. Fuels

    b. Heat

    c. Oxygen (O_2)

Interrelation among these three factors is often called "Fire Triangle". Without one of them fire will not occur. Fire needs dry fuels, enough heat, and enough oxygen to start combustion.

This concept also guides ways to stop fires. By separating or minimizing one of them fires will not start. Minimizing fuels is done by making 'fire breaker' to separate from heat sources. Heat is minimized by maintaining humidity (e.g. by watering). Oxygen is minimized by covering fire with soil. Textbox below provide a simple demonstration of fire triangle.

Demonstration of Fire Triangle

Provide a candle and matches. We have all three factors to start fire: fuel (candle), heat source (matches) and Oxygen (available freely in atmosphere).

Provide a glass taller than the candle. Lit the candle and cover it with the glass. After sometime the fire will turn off. This is caused by disappearance of Oxygen in a limited space covered by glass. This shows that unavailability of one of the factors of fire triangle will make easier to stop fires.

2.3.3. Causes and Impacts of Forest Fires

Start the session by digging participants' knowledge and experiences and jogging their memories on causes and impacts of forest fires. Proceed with discussion in the classroom.

Ask the participants to write down history of forest fires in their areas in recent years.

2.3.3.1. Causes of Forest Fires

Because Oxygen is freely available, we only focus discussion on fuels and heat.

(1) Fuels

Fuels are the most dominant factor in starting fires. Fuels availability in forest and its relation to forest fires should be considered.. Below are classifications of fuels in several types of forest.

a. Primary forest

In this type of forest, litter is thin, humidity is high and the temperature is low because crown cover is almost 100%. Sunrays on forest floor are almost 0%.

b. Logged over areas

In logged over areas, litter is thick. This is caused by leftover of logging activities. This thick litter is under open crown. In dry season the humidity is low while the temperature is high, so that litter is easily burnt. In a long dry season fires are difficult to stop.

c. Plantation forest

In young plantation forests with crown cover less than 100%, fuels are available in term of grasses and shrubs. As in logged over areas in dry season temperature in forest floor is high. Risk of fire is also high.

d. Peat forest

In peat forest the fuels are the peat itself located under the ground surface. In rainy season, peat land are usually immersed in water. In a normal dry season, only upper layer is dry. Fire is not easily happened. However, in long dry seasons, deep layers

of peat (can reach tens of cm) are dry and are easily burnt. If this happens, although slow, peat fires are difficult to stop.

e. Grassland and shrub

Litter in grassland and shrubs are sensitive to fires even in normal dry seasons. Because fuels are not abundant, usually fire is not as big as in peat forest and logged over areas.

(2) Heat

Heat is closely related to fire or flame sources. Generally it is estimated that around 90% of fire sources come from human activities. The rests is brought about by natural causes.

a. Human factor

Human can be a factor of fire because of their carelessness or their deliberateness.

Examples of carelessness:

- Farmers prepare their farmlands through burning or slash and burn;
- Hunter, grasser, fire wood collectors go to forest using fire for illumination or to gather honey;
- Cigarette or fire remnants;
- Uncontrolled burning in plantation.

Examples of deliberateness:

- Process of forest conversion into farm land and settlement using fire as cheap ways to clear land;
- Process of forest conversion into plantation and land clearing using fires;
- Disappointment of community on plantation projects.

b. Natural factor

- Climate (long dry seasons, El-Nino phenomenon)
- Thunderstorm, volcanic activities and other natural causes.

2.3.3.2. Forest Fires Impact

(1) Smoke

Smoke causes illness in human respiratory system, and transportation disruption. It also becomes regional problem since smoke can travel to neighboring countries.

(2) Impacts on forest and environment

- Fires affect forest ecosystem and biodiversity. Fires disturb five ecological processes in forest such as natural succession, organic material production and decomposition, nutrient cycle, hidrology cycle, and land formation.
- Burnt trees will decrease Carbon dioxide absorption. This will increase green house effect and decrease microclimate function of the forest.
- Fires decrease biodiversity. Fires also affect reproduction activities of some primates, amphibian and reptilian.

(3) Economic losses in term of destruction of stands, non-wood forest products, fruits.

- Agriculture sector losses
  Productivity of some agriculture commodities is affected by smoke generated from forest fires. Productivity of oil palm tree in Jambi, Sumatra, Indonesia, for example, in three years decreases about 55% after forest fire.

- Social impact
  Forest and land fires affect local community social and

economic activities. When these activities are disturbed, they will try to find easy alternatives that will cause other negative impacts.

2.3.4. Intensity of Fire Spread and Types of Forest Fires

2.3.4.1. Intensity of Fire Spread

Although it is believed that most of forest fires are caused by human activities, intensity of fire spread is intensified by natural condition such as characteristics of fuels, weather condition and topography.

(1) Characteristics of fuels

Knowledge on fuels is important in answering question: *"How can we prevent fires?"*

a. Fuels and their availability

- What kind of plants is sensitive to fires? Trees, shrubs or grass? Trees and timber are not as easily burnt as grass.

- Death plants are easier to be burnt than the live ones.

- How much are the fuels?

- Types of land-covering plants.

b. Fuel humidity

Rather dry living trees/plants will be easily burnt and humid death plants will not be easily burnt.

c. Fuel composition and structure

- Standing fuels are easier to burn than the laying ones because of more Oxygen supply.

- Dispersed fuels decrease the spread of fires.

- Small and dry fuels speed up combustion. Solid fuels slow down combustion

(2) Weather condition

Weather condition before and during fires will determine how the fires start and behave.

   a. Temperature

Hot weather before and during fires facilitate fires and make it difficult to stop.

   b. Wind

The stronger the wind the more difficult to manage the fires. Wind pushes flame to touch fuels in the front and make it jumps. Wind also supplies more Oxygen and helps to dry fuels.

   c. Humidity

Rain and high humidity make fuels wetter and slow down fires.

(3) Topography

   a. In steep slopes flame become closer to fuels in the front so that fire spread easily that on the flat surface.

   b. Generally in South East Asia, east-facing slopes receive more heat in the morning. When fire occurs in this slope it is difficult to manage in the morning. In west-facing slopes, on the other hand, receive more heat in the afternoon. Fire in this slope is more difficult to handle in the afternoon.

Rule of thumbs: slope vs. fire spread
The steeper the slope the quicker is the speed of fire spread.

2.3.4.2. Types of Forest Fires

Based on the source of fires, forest fire can be divided into two:

(1) Ground fire

This kind of fire is caused by coal (e.g. in east Kalimantan,

Indonesia), bauxite and peat. Although this type of fire is slowly spread, it is difficult to stop.

(2) Surface fire

This fire occurs because of shrubs, grass, logging waste burning. Normally the speed of fire spread is about 4 - 7 km per hour, but if strong wind blows on steep slope, it can reach 10 km per hour.

2.4. Efforts on Forest Fire Prevention

Objective:	After taking this subject the participants are expected to be familiar with efforts in forest fire prevention and are able to implement them in their areas
Methods:	- Lecture - Discussion
Allocated time:	6 x 45 minute divided into four seasons: - Can we prevent forest fires? - Techniques of Forest Fire Prevention - Prevention of Grassland Fires - Local Wisdom in Forest Fire Prevention

2.4.1. Can we prevent forest fires?

Start the session with brainstorming on forest fire problem and prevention activities. Because this session is only an introductory, use allocated time wisely. Guide the discussion on:
- Steps taken by community to prevent forest fires.
- Individual steps to prevent forest fires.
- What can people do to control forest fires?
- What can individual do to decrease forest fires?

2.4.2. Techniques of Forest Fire Prevention

Start this session with an exercise to refresh participants' memories

and dig up their knowledge on forest fire prevention. Follow with a discussion. To facilitate them use the following questions:

Checklist: efforts in forest fire prevention

1. Are people familiar with means of forest and fires prevention?
2. Is there any forest and land fires extention activities/compaigns?
3. Do people involve in forest management with government officials or forest concession?
4. Do people know how to conduct controlled burning? What people's activities that caused fires?
5. Do people know how to make fire break?
6. Do people know how to make green belt to prevent fires?
7. What efforts that people usually do to prevent forest and land fires?

---

(1) Definition and scope

    a. Forest fire prevention is all efforts, actions or other activities in order to prevent or reduce possibility of forest fires.

    b. Fire anticipation is an early step in system of forest fire prevention.

    c. Prevention to reduce fire risk, including: education and other activities
       - Pre-attack by reducing fuel spread and creating fuel break
       - Fire attack

    d. Forest fire prevention activities are directed to community and the impact areas.

(2) Efforts in forest fire prevention

    a. Social, cultural and economics approaches
    To motivate and to encourage people involvement are the best way out in forest fire prevention. These approaches emphasize effort in enhancing people awareness on the danger of forest fires. These can be done through:
       - Campaigns, extension activities, socialization

- Community-based forest fire management
b. Technical approaches
In fire terminology, technical approaches are all efforts either facilities or activities directly useful in reducing fire risks. These include:
- Development of man-made green-belt
- Maintenance of natural fire break
- Development of fuel break
- Development of fire break
- Fuel management
- Plant management

c. Forest management approaches
The success of forest management (including forest fire management) is interrelated to the discipline in application of forestry science in general. Clear regulation and law enforcement are fundamental in forest fire prevention. Development of fire-resistant infrastructure and selection of tree species are also essential in managing fires.

2.4.3. Controlled Burning

One of the most effective ways of forest fire prevention is zero burning. This, however, is still impossible to implement where people are used to using fire to clear their lands. To anticipate uncontrolled spread of fire and to reduce its danger, timing for burning should be considered.

PERIOD	FIRE BEHAVIOR
A	Fire is intensive and difficult to manage
B	Fire is slowly reducing and is easy to handle
C	Fire is in its lowest level and is easy to manage
D	Fire is increasing and rather difficult to manage

2.4.4. Prevention of Grassland Fires

Imperata cylindrica is a kind of fuel that is easily burnt in dry seasons. Fires in a relatively short of time can destroy an extensive area. These fires can also stimulate another domination of *Imperata cylindrica*. Green breaks and green strips can help preventing fire spread.

Fires prevention in this kind of grass needs lot of resources, however this is more effective and efficient than suppression. Some techniques of prevention of grassland fires are discussed below:

(1) Grass cutting

Grass cutting and removing can decrease fire danger effectively. In a day one man can cut about 200 - 400 m2 of grassland.

Flame height in grassland fires can reach twice of the grass height. Cutting should be done so that the height of the remaining grass is less than the height of the main tree species. This is done to facilitate fire suppression.

Because Imperata *cylindrica re-grows* immediately after cutting, it needs frequent cutting.

(2) Grass Crushing

Grass crushing is usually done by pressing it with heavy cylinder (made of timber or metal). The crushed grasses press and kill the lower layers. Although this practice is useful in reducing fire danger, fires will still occur. However, the fires will start slowly. If the grasses height is kept at 25 cm, the flame is estimated to be around 50 cm. At this height fires are easy to manage.

Advantages of grass crushing:

a. Grass crushing can decrease fire spread substantially because of the decreasing air circulation.

b. Grass re-growth after crushing is only 20% -60% of re-growth after cutting. Re-crushing is less often than re-cutting.

c. Grass crushing is easier than cutting.

d. Crushing can reduce shading on main tree species.

e. Crushed grasses could be mulches for soil.

When to crush?

a. When the height is around 1 m. Crushing too young and less-than 1 m grass is not effective because they will easily re-grow.

b. Crushing is done in early rainy and dry seasons. In rainy seasons, crushing is better done after raining. In dry seasons, crushing is done to prevent fires.

How to crush?

a. Crushing is done at the same direction.

b. In slopes crushing is done from higher places to lower ones.

(3) Firebreaks

Firebreaks in grassland are necessary to prevent fire spread. When reaching firebreaks, the spread will decelerate to give opportunity to attack fires.

Although it is difficult to determine exact width of firebreaks, six meters to 30 meters are suitable to prevent fire spread. The use of natural vegetation is suggested, and if possible green belt by planting productive and multi- purpose plants. In hilly areas, horizontal fire breaks (cutting slopes) should be made wider than the vertical ones because fires are easier to jump to higher places.

Types of fire break in grassland:

a. Natural fire breaks: rivers, rocks, creeks

b. Artificial fire breaks: roads, streets, water canals, rice fields

c. Green belts: vegetative belts (fire resistant)

d. Clear-land belts

2.4.5. Community Wisdom and Participation

2.4.5.1. Community Wisdom

Many indigenous people have practiced preparing farmland by burning them for a long time. Some traditional communities have customs and practices in implementing local rules effectively for many years. They maintain the balance between farming needs and forest environment.

Rules or custom on fires in communities can be learned from local elderly or leader and the possibility to re-implement them could be explored. The objective is that burning activity can be monitored and controlled effectively by community to prevent fires. The important thing to prevent fire is to implement rules consistently and give sanction for the violation.

Generally local wisdom related to controlled land burning and requirements needed by community are:

(1) Obtain permit from authorized community leaders;

(2) Obtain permit from local government based on local rules or regulation;

(3) Choose the right time, not to hot and not too cold (e.g. late afternoon);

(4) Consider "fire-free period";

(5) Know boundary of landowner;

(6) Gather people, friends, or neighbors to help suppressing fires;

(7) Clean vegetation in and around the place is intended to be burnt to prevent fire spread;

(8) In slopes, burning starts from higher places;

(9) Put into effect sanction for violation of the rules and obligation to pay fines for damages caused by fires.

2.4.5.2. Developing Community Participation

Land and forest fires have become national and even global problems. All stakeholders should be responsible to prevent and manage land and forest fires. Community participation is a key factor in land and forest fires prevention.

2.5. Methods and Tools for Community Facilitation

Objective:	After taking this subject the participants are expected to be familiar with effective methods and tools in Community Facilitation for forest fire preventions
Methods:	- Lecture - Discussion
Allocated time: 8 x 45 minute	

2.5.1. Brainstorming

Start the session with asking a question:

- "What is facilitation" and "What is the difference between facilitation and general education".

- Write the answers on flipchart.

- Ask the participants to discuss their opinions so that a conclusion can be reached:

Community facilitation is a learning process by giving motivation and support to the community so that they can identify their own potentials and are courageous to take action to improve their quality of life.

Community facilitation refers to non-formal education for adults so that there is no concept of teachers and students. There are only facilitators and participants.

2.5.2. Methods of facilitation

Community facilitation is a learning process by giving motivation and support to the community so that they can identify their own potentials and are courageous to take action to improve their quality of life. To achieve this goal, every facilitating activity should contain components such as; material, methods, aids and comfortable situation for facilitation.

Conditions to improve community participation:

1. Presentation of visual information.

2. Facilitator should not dictate his/her opinion.

3. Appropriate use of methods and techniques.

Generally there are three methods of facilitations:

1. Facilitation methods based on the media used.

2. Facilitation methods based on the relationship between facilitator and target.

3. Facilitation methods based on analysis of the target psychosocial.

Facilitation methods based on the media used:

- Oral, directly (face to face) or by telephone, or indirectly (by radio, television or cassette tapes).

- Print media, through magazines, newspapers, posters, photos, etc.

- Projected media: film, slideshow, etc.

Facilitation methods based on the relationship between facilitator and target:

- Direct communication: direct talk orally, or through telephone or facsimile which enable the communicators to get responds in a relatively short time.

- Indirect communication through third parties, either human or other media, which prevent the communicators, to get responds in a relatively short time.

Facilitation methods based on analysis of the target psychosocial:

- Individual approach
- Group approach
- Mass approach

Each method has its own strengths and weaknesses. The table below gives a summary of methods:

Function/characteristics of Facilitation Methods	Mass Media	Talks	Demon-stration	Local People media	Group Discussion	Dialogue
To raise awareness for innovations	xxx	x	xx	xx	o	o
To raise awareness on their own problem	o	x	xx	xxx	xxx	xxx
Transfer of knowledge	xxx	xx	xx	xx	x	xx
Changing of behavior	o	o	xx	x	xxx	xxx
Application of other people knowledge	o	o	x	xx		x
To activate learning processes	o	o	x	xxx	xxx	xx
Problem solving	o	o	x	xx	xx	xxx
Abstraction level	xxx	xx	o	x	x	x

Remarks:
o = unexpected
x = level of expected benefit (depend on the intensity)
x   : low
xx   : medium
xxx : high

2.5.3. Facilitation Techniques

Facilitation techniques relates to the methods used. Some examples below are often used:

1. For mass methods use speech or exhibition.
2. For group approach use discussion, seminar workshop or comparative studies.
3. For individual approach use home or office visits.
4. If using media use print (leaflet, booklet, brochure), electronics (radio and television), and other media (warning signs).

Principles of facilitation to increase community participation:

1. Sharing of learning experiences.
2. Community is the main actor.
3. Facilitator should come from different background.
4. Flexible implementation.
5. Comfortable atmosphere.
6. Information crosscheck.
7. Discussion of field results.

2.5.4. Facilitation Tools

Extension is a non-formal learning process consisting of some related components in achieving the stated goals. Achievement of goals or objectives is not the only determining factors. Other components are target, materials, tools, display and situation or condition where the extension is conducted.

Extension tools are tools used to make the communication and interaction more effective. Extension displays are extension aids that can be touched, seen, smelt, heard so that the target understand what is being delivered.

Facilitation tools:

- Can overcome the limitation of target experience.
- Can reach larger space.
- Facilitate direct interaction between the target and his/her environment
- Give comprehensive experience.
- The target can transform knowledge and skill through her/his senses.
- Can raise motivation and stimulation to learn.
- Can produce uniformity in examination and interpretation.
- The target can improve his/her capability in differentiating and interpreting with symbols.

Displays

Usually these are used in combination. Displays should be easy to understand by the target and the ideas should be easily captured.

The appropriately used displays will:

- Avoid misunderstanding or misinterpretation
- Clarify the explanation
- Give longer impression
- Catch and focus the interest
- Give strong motivation to apply what is suggested

Classification of displays:

1. Original or real, death or living things, including: fish in an aquarium, potted plants, insectariums, herbarium, etc.
2. Imitations: miniatures, scale models, dioramas, statues, cross section of a model.

3. Drawings, caricatures, illustrations, leaflets, folders, poster, etc.

4. Projected drawings: films, slides, photos, etc.

Development and Uses of Displays

General guidelines of development of displays:

i. Making simple drawings/pictures:
   a. Copy with thin, transparent paper
   b. Scale copying
   c. Cut and paste pictures from magazines, newspapers

ii. Tools and materials to make words and pictures:
   a. Good paints
   b. Colored pencils
   c. Black ink
   d. Brush
   e. Silk print, etc.

2.5.6. Checklist for Community Organization:

1. Objectives:
   - Empowerment
   - Strengthening
   - Facilitation

2. Steps in community organization:
   - Preparatory meeting
   - Formulate strategy
   - Elect the leader
   - Identify the problems
   - Build a communication system
   - Take action
   - Connect to outside world
   - Collect fund
   - Build small groups

3. Components of community organization:
   - Community
   - Methodology
   - Approach methods
   - Organizing experience
   - Organizational principles
   - Organizing strategy
   - Understanding
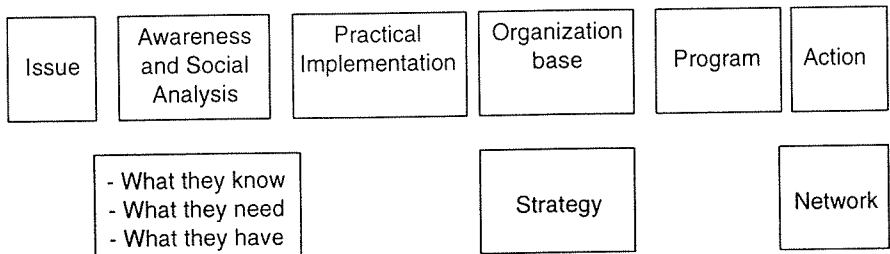   - Social analysis

4. Constraints in implementation of community organization:
   - Human characteristics
   - No capability to organize
   - Outside influences:
     - Culture
     - Social class
     - Economy
     - Politics

5. Goals:
   - Mass mobilization
   - Building values (democracy, justice, trust, togetherness)
   - Build and elect leaders
   - Build critical awareness
   - Build trust

6. Strategy:

Issue	Awareness and Social Analysis	Practical Implementation	Organization base	Program	Action
	- What they know - What they need - What they have		Strategy		Network

7. Social analysis:

This is an effort to achieve a complete picture of social situation. Social analysis should be done carefully because this is a social disease diagnose. Through this analysis a complete picture of community should be gathered. The analysis should be supported with accurate and factual data and information.

a. Constraints in conducting social analysis:
   - Complexity in community
   - Changes in culture and customs
   - Social system
   - Bureaucracy
   - Ever changing community condition

b. Steps in social analysis:
   - Experience
   - Analysis
   - Reflection
   - Planning

c. Elements in social analysis
   - Historic measurement of a situation
   - Structural element
   - Division in community
   - Main problem

d. The Process consist of:
   - Raising people awareness
   - Determining target
   - Determining tactics and strategies

e. Basic steps:
   - Start with searchable phenomenon, draw real social situation. Dig as much facts, data and trends in the community as possible, either negative or positive.
   - Identify the system and classify the facts according to the system.

- Draw a summary under different systems (structural, economics, social, cultural).
- Do observation.
- Analyze each system by focusing on relationship among structures.
- Relate the systems.
- Determine how the system relates to the community.
- Draw conclusions.

CHAPTER III. FIELDWORK

3.1. Evaluation of Formation and Development of Community Groups

> **Objective:** After taking this subject the participants are expected to be able to identify and evaluate community social and cultural characteristics, their understanding of forest fire preventions and village analysis
>
> **Methods:** - Discussion
> - Fieldwork
> - Presentation
>
> **Location:** Village surrounding forest
>
> **Allocated time:** 20 x 45 minute

Notes for facilitators:

1. This session is designed to detect participants' capabilities in identifying groups in the community and all aspects related to land and forest fires prevention.

2. Give opportunity to the participants to develop their potentials.

3. Give facilitation roles in discussion or evaluation session to the participants.

Steps:

1. Introduce the participants to the village leaders (formal and informal) and deliver the objectives.

2. Give opportunity to have a discussion. Explain that the groups' intention is to have a fieldwork and do not promise any project.

3. Make sure that each group go to the right location and guided by the right person.
4. Collect data and information (see sample tables).
5. Discuss the results with the leaders.
6. Guide the participants to always listen to the community.

Identification of Community Characteristics, Social and Cultural and Their Customs

No	Condition	Field Evaluation Results
1.	Members of community that are go in and out of the forest to collect forest products (rattan, gum, resin, nuts, honey, fish)	
2.	People income level	
3.	Custom/tradition/behavior related to land preparation for farm, garden	
4.	People opinion on surrounding forest	
5.	Favorite trees	
6.	Agricultural patterns	
7.	Traditional wisdom, including taboo	
8.	Expected environment condition, including people needs from forest	
9.	Problem faced by community concerning their living	
10.	Togetherness in the community	
11.	Relationship with local forest managers	
12.	Other things to consider to do business	
13.	The existence of farmer groups	

Inventory of Community Characteristics, Social and Cultural and Their Customs

No.	Expected Condition	Behavior Qualification			Attitude Qualification		
		K1	S	A	K2	W	C
1.	Obedience to the signs of danger in the forest						
2.	Willingness to report condition sensitive to forest fire to the authority						
3.	Willingness to warn somebody disobeying signs of danger in the forest						
4.	Willingness to assist protecting the areas sensitive to forest fire						
5.	Willingness to report fires occurrences						
6.	Willingness to assist initial attack						
7.	Willingness to lend tools possible to be used in initial attack						
8.	Willingness to build an environmental group						
9.	Willingness to assist provision of tools and equipment						
10.	Willingness to assist to build water tank/ reservoir						
11.	Willingness to maintain the existing water tank/ reservoir						
12.	Willingness to assist to build greenbelts						
13.	Willingness to maintain the greenbelts						
14.	Willingness to take part in facilitation/extension activities						
15.	Willingness to implement extension messages						

Notes:　Behavior Qualification:　　　　Attitude Qualification:
　　　　　　　　(v)　　　　　　　　　　(X= low, XX= medium, XXX = high)
　　　　　K1　　Knowledge　　　　K2　　Know
　　　　　S　　　Skill　　　　　　　W　　　Willing
　　　　　A　　　Attitude　　　　　CCapable of

PLANNING FOR GROUP FORMATION

A. Criteria for group members : 1.
                                                2.
                                                3.
                                                4.

B. Number of members   : Depend on group's approval

C. Group organization   : Depend on group's approval

D. Name of the group   : Depend on group's approval

E. Method of approaches   : 1.
                                                2.
                                                3.
                                                4.

F. Material to be prepared   : 1.
                                                2.
                                                3.
                                                   4.

PLAN FOR GROUP FACILITATION

NO	LOCATION AND TIME	TARGET	METHODS	MATERIAL	RESPONSIBLE PERSON

EXAMPLE
ON THE SPOT ANALYSIS
OF LAND AND FOREST FIRES PREVENTION ACTIVITIES
VILLAGE OF: ....

NO	REQUIRED FACILITATION MATERIAL	METHOD	TOOLS	DISPLAYS	LOCAL RESOURCE PERSON	RESPON-SIBLE PERSON
1.	Efforts in people income improvement from non-timber forest products business					
2.	Efforts in forest values improvement for traditional activities related to land preparation for agricultural activities					
3.	Efforts in improvement of perception/ understanding on surrounding forest					
4.	Promotion of greenbelts activities					
5.	Socialization of traditional wisdom including taboo in the community					
6.	Efforts in improving community togetherness					
7.	Efforts in improving elation-ship with local forest managers					
8.	Obedience to danger signs in the forests					
9.	Willingness to report con-dition sensitive to land/forest fires to the authorized parties					
10.	Willingness to warn some-body breaking the rules, e.g. warning signs in the forests					

11.	Willingness to assist to protect forest through patrolling in fire sensitive areas					
12.	Willingness to report fire occurrences					
13.	Willingness to assist in initial attack					
14.	Willingness to lend tools and equipment to be used in initial attack					
15.	Willingness to help provi-ding tools and equipment					
16.	Willingness to assist in building water tanks/ reservoirs					
17.	Willingness to maintain water tanks/ reservoirs					
16.	Willingness to assist in buil-ding firebreak/greenbelts especially in his land					
17.	Willingness to maintain firebreak/greenbelts					

3.2. Development of Methods and Tools for Community Facilitation

Objective: After taking this subject the participants are expected to be able to develop effective scenario, tools and displays in Community Facilitation for forest fire preventions

Methods: - Discussion
- Displays
- Presentation

Allocated time: 20 x 45 minute

Notes for facilitators:

1. This session is designed as exercise to complete study of the village related to land and forest fires prevention.

2. Give opportunity to the participants to develop their potentials.

3. Give facilitation roles in discussion or evaluation session to the participants.

Steps:

1. Based on the confirmed results of identification in the previous session develop:
   a. Facilitation scenario suitable for the selected method.
   b. Facilitation materials.
   c. The appropriate tools and displays.

2. Prepare the following material for developing facilitation tools and displays:
   a. Paint brush
   b. Good paint
   c. Colored pencils
   d. Black ink
   e. Letter set
   f. Silk-print
   g. Markers
   h. Paper
   i. Manila Carton

3. Present the results and discuss as needed.

3.3. Development of Action Plan for Community Facilitation in Land and Forest Fire Prevention

Objective: After taking this subject the participants are expected to be able to develop and present action plan for land and forest fire prevention

Methods: - Discussion
          - Displays
          - Presentation

Allocated time: 20 x 45 minute

Notes for facilitators:

1. This session is designed as exercise to develop action plan for land and forest fires prevention.

2. Give opportunity to the participants to develop their potentials.

3. Give facilitation roles in discussion or evaluation session to the participants.

Steps:

1. The facilitation action plan in intended to be submitted to donor (for example: Forestry Services, Ministry of Forestry, forestry companies). Therefore, the action plan should be formulated carefully and accurately.

2. The expectation is to improve people prosperity and environment condition. The plan should be able to attract donor interest. Minimum content of the plan should present:
   a. Introduction (background and objectives)
   b. Impacts of activity
   c. Description of activities and schedule
   d. Organization and funding
   e. Implementation

f. Closing
3. Present the results (the action plan from each group)

REFERENCES

BAPPENAS, 1998. Tropical Forest Fire: Prevention, Control, Rehabilitation and Trans-Boundary Issues. Proceeding International Cross Sector Forum on Forest Fire Management in South East Asia. Japan International Cooperation Agency (JICA) and International Tropical Timber organization (ITTO). Jakarta.

CIFOR/ICRAF/UNESCO, 1998. Fire: The Underlying Causes and Impacts of Fires in South East Asia. Bogor.

Dirjen PHPA, 1994. Prosedur Tetap Pencegahan dan Penanggulangan Kebakaran Hutan. Jakarta.

Edi Purwanto, 1996. Forest Fire and Drought in Indonesia. Indonesia Forestry Journal Vol. 3/1996-1997. Jakarta.

Edi Purwanto, 2001. Memahami Participatory Rural Appraisal (PRA). Bahan Pelatihan Perencanaan Wanatani (Agroforestry). Pusat Diklat Kehutanan, Bogor.

ITTO, 1997. ITTO Guidelines on Fire Management in Tropical Forest. Yokohama.

ITTO/IPB, 1999. National Guidelines on the Protection of Forest Against Fire. Project PD 12/93. Integrated Forest Fire Management in Indonesia, Bogor.

Nicolas, M.V.J. and G.S. Beebe, 1999. The Training of Forest Firefighters in Indonesia. Forest Fire Prevention and Control Project. European Union and Ministry of Forestry and Estate Crops. Palembang.

Simorangkir, D. and Sumantri, 2002. A Review of Legal, Regulatory and Institutional Aspects of Forest and Land Fires in Indonesia. Project

FireFight South East Asia, Bogor.

Soekarjo, BH, 1999. Perilaku Api. Materi Pelatihan Calon Pelatih Pengendalian Kebakaran Hutan. Kerjasama ITTO-PKA dan Fakultas Kehutanan IPB. Bogor.

Schweithelm, J., 1998. The Fire This Time-An Overview of Indonesia's Forest Fires in 1997-1998. Discussion Paper Prepared for WWF, Jakarta.

Appendix 1.

Hand Out: Local Community Empowerment in Forest Fire Management

Community support and participation are key factors in achieving success in land and forest fire management, especially forest fire prevention. Land and forest fire management are suggested to be institutionalized in non-formal community institutions/groups. Special institution should not manage this. More important is that the efforts can be empowered through existing institution. Considering this, community empowerment strategy should be stressed in the discussion.

a. Community Empowerment in Forest Fire Prevention

Community development should be considered as community empowerment and not only 'a one-time project' where it ended when there is no more assistance from outside. A good program in forest fire prevention should be directed toward improving community capability and creating self-reliance.

Empowered community is a community with strong mental ability, educated and has a good intrinsic value. These values are important sources of empowerment such as cooperation and teamwork.

b. Roles of Leaders in the Group
The success of community development for forest fire prevention cannot be separated from figure of its leader. The leader is the facilitator, motor, mediator and organizer in program implementation. Roles of the leaders can be described as follow:
1. Facilitator, the leader should 'know' and is able to describe program of forest fire prevention, from planning, implementation, and control;
2. Motor, the leader should 'know' and is able to initiate

cooperation and participation in the community in implementation of forest fire prevention program;

3. Mediator, the leader should 'know' and is able to act as 'hub' for interest of related elements, especially when a problem arise;

4. Organizer, the leader should 'know' and is able to manage community resources in relation to forest fire prevention.

c. Requirements for A Leaders

A good leader should have:

1. A high level of interest to learn. A community leader should always improve his knowledge on background and characters in his community, policies, activity management and other technical capabilities;

2. A leader should have or always try to improve his communication skill horizontally (with his community member) and vertically (with government official, company, NGO, etc.);

3. A leader should have or always to improve his honesty, competence and tolerance.

d. Group Rules in Forest Fire Prevention

An institution or organization will not be effective in achieving its goals if it has no rules. Often traditional community has rules (customary law) related to environment management, for example the utilization of community forest/land. In some community forest fire prevention is clearly regulated and in some other is not clearly stated but mentioned in forest protection. These regulations are usually not written. In the past community members always obey regulation and their values.

However, these days it is difficult to preserve these customary laws among traditional people. The values are changing because there is no more model figure in the community. Other factor is infiltration from outside.