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Synthesis Report on Ex-Post Evaluations

ITTO Project PD 17/87 (F)

**“Investigation of the Steps Needed to Rehabilitate the Areas
of East Kalimantan Seriously Affected by Fire”**

ITTO Project PD 84/90 (F)

**“The Establishment of a Demonstration Plot for Rehabilitation of Forest
Affected by Fire in East Kalimantan [Phase II of PD 17/87 (F)]”**

ITTO Project PD 12/93 Rev.3 (F)

**“Integrated Forest Fire Management in Indonesia - Phase I:
National Guidelines on the Protection of Tropical Forests Against Fire”**

Prepared for the ITTO

by

Mr. James C. Sorenson

And

Dr. Ram Prasad

SYNTHESIS REPORT

Background Information About the Three Projects.

Indonesia produces a great proportion of the tropical timber used throughout the world. The timber industry is therefore of great economic importance to the nation and is a source of income for a large part of its population. Unlike other natural resources like oil and gas, timber is renewable; thus the forestry and timber industries provide a sustainable source of income and welfare.

In 1982/83 a very serious drought struck the southeast Asian region. Initiated by shifting cultivation practices and other causes, forest fires destroyed huge parts of the tropical rain forests. In East Kalimantan, 3.2 million hectares burned, of which 2.7 million hectares consisted of tropical rain forest. This tragedy was repeated again in 1994, and even more so in 1997/98. Other provinces experience similar devastation due to fires on an increasingly regular basis. The ecological and economic damage caused by these fire episodes was enormous. The harmful effects on the whole environment, particularly soil, hydrology and wildlife, will be long-lasting. The economic damage caused by the events is estimated to be in the tens of billions of US dollars.

Droughts and forest fires of a limited extent appear periodically, so it has become increasingly important to know what can be done to prepare the Government of Indonesia to deal with the problem. Because major fires in tropical rainforests have been a relatively rare event until recent decades, the Ministry of Forestry has not had an organizational structure in place to manage forest fires. Before a meaningful program could be started, it was necessary to understand the extent and importance of the problem.

The major fire event of 1982/83 aroused worldwide interest, and the International Tropical Timber Organization was asked to fund a project to study its effects, with the ultimate goal of developing a mitigation plan. This led to PD 17/87(F), "Investigation of Steps Needed to Rehabilitate the Areas of East Kalimantan Seriously Affected by Fire".

The study began in June of 1988, with an estimated duration of twelve months; however, it was recognized that it would necessarily be followed by at least one companion project to begin implementation of the identified remedies.

The first of the subsequent projects, PD 84/90 (F), "The Establishment of a Demonstration Plot for Rehabilitation of Forest Affected by Fire in East Kalimantan", followed naturally from the findings of PD 17/87(F). During the process of establishing that demonstration plot it became apparent that the overall ability of the Ministry of Forestry to deal with the total forest and land fire issue was in doubt. A number of un-coordinated efforts were being made in the area of fire control training, carried out by various donor nations, and it was quickly recognized that this ad hoc approach was not leading to an organization that could cope with the long term problem. The ITTO was asked to support a project to help address the overall forest fire management issue, and this resulted in the funding of PD 12/93 Rev. 3 (F), "Integrated Forest Fire Management in Indonesia – Phase I: National Guidelines on the Protection of Tropical Forests Against Fire."

Ex-Post Evaluations of the three projects dealing with forest fire management in Indonesia were commissioned by the ITTO Committee on Reforestation and Forest Management at its Twenty-eighth session at Yaoundé, Cameroon in May/June of 2001. Reports on each of these have been done; this is a synthesis of all three.

The ultimate Executing Agency for these projects in all cases was the Ministry of Forestry, but the work was done by various units within the Ministry, or handled by contracts. In the case of PD 17/87(F), the Ministry was assisted in Samarinda by the Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ). Establishing the Demonstration Plot under terms of PD 84/90(F) was carried out by the Agency for Forestry Research and Development, again with assistance from GTZ. The Directorate General of Forest Protection and Nature Conservation was initially given responsibility for carrying out PD 12/93 Rev.3(F), but the effort was later handled by the Faculty of Forestry, Bogor Agricultural University.

Conclusions of the Evaluations of all Three Projects.

(1). Overall role and meaningful contribution of the three projects in forest fire prevention and rehabilitation of areas damaged by forest fires in Indonesia.

The three projects covered by this report follow each other in logical sequence and, taken as a whole, offer the GOI an opportunity to establish a meaningful and effective forest fire management program to be used

throughout the country. PD 17/87(F) was originally designed to address one local threat to the timber resource. However, as it progressed, it was very quickly evident that another project would be required to make the process complete. Thus was begun PD 84/90(F), to set up a demonstration area showing what was learned in the first project, (actually, a study of possible techniques). The value of these two initial efforts into the arena of fire management would have been limited without the logical follow-up with PD 12/93 Rev. 3 (F). Work on the first two projects had led to the realization that Indonesia really had no way of effectively dealing with the inevitable fire years that would come; which in turn led to interest in creating the means to do so.

(2). Overall impact on and relevance of the three projects for the Executing Agencies, the forest industry sector and local communities in Indonesia.

The impact and relevance of PD 17/87(F) is seen in the fact that its findings led to the establishment of the demonstration area; and subsequently to the realization of a need for serious work on developing a fire management program. Taken as a whole, the three projects will mean much over the next years to all stakeholders in the forests of Indonesia. The various directorates within the Ministry of Forestry will be affected by the new direction they will be given to deal with fire and its many ramifications. The forest industry, within Indonesia and elsewhere in the world, will benefit because the resource will be better protected and longer lasting. Improved fire protection, resulting from implementation of the project findings, will benefit local communities, and the people of Indonesia in general, because all forest-related resources will be better protected.

(3). Overall attainment of the objectives and assessment of the overall effectiveness of the three projects.

Each of the projects experienced its own level of attainment, with the highest marks going to PD 17/87(F). Other than some question as to its effectiveness in dissemination of its findings on ways to rehabilitate fire-damaged areas to as wide an audience as possible, it can be said that this project completely met the goals set for it. The demonstration area created under terms of PD 84/90(F) would probably have provided an acceptable level of information, (although to a less than optimal number of people), for many years to come. The fact that unusually severe fire conditions destroyed most if not all of the demonstrations, (in addition to the unforeseen change in land use policies of the GOI), should not be charged as a negative against this project. The greatest potential for benefit to be realized from the three projects is still to come; and it will only come about if the GOI chooses to carry out the plan outlined in the projects' main output: "National Guidelines on the Protection of Tropical Forest Against Fire".

(4). The appropriateness of the design and implementation approaches of the three projects, in light of their efficiency and effectiveness to assist promoting forest fire prevention and rehabilitation of areas affected by forest fire.

Each of the three projects exhibited its own level of appropriateness regarding design and approach to implementation. Once again, PD 17/87(F) gets high marks in this regard, with the possible criticism about the haphazard manner in which its findings were ultimately presented. These report documents were extremely thorough, but somewhat difficult to use, owing to a lack of organization.

Several design and implementation problems were identified in PD 84/90(F), beginning with site selection, which was found to be too large and too far removed from potential users. There is also some question about the ability of the plantings, as actually carried out, to demonstrate the desired techniques. This last criticism cannot be verified, because the life of the project was terminated before there was time to see meaningful results.

The design and implementation approach of PD 12/93 Rev.3 (F) is very difficult to evaluate at this time. The earliest document provided to evaluators was already identified as "Revision 3", and it was developed in 1993; it is difficult to know what earlier versions may have contained. It appears that the original executing agency, the Directorate General of Forest Protection and Nature Conservancy of the Ministry of Forestry, (a logical choice), was unable to handle the assignment. The task was given, under contract in October of 1996, to the Faculty of Forestry, Bogor Agricultural University (IPB). At some point in this process, the Common Fund for Commodities (CFC) became involved as a source of funds. The CFC introduced the mandate of training field personnel in techniques of fire management, thus adding another dimension to the task. In evaluating this project, it can be said that the creation of the Guidelines and accompanying

documents was carried out very well. The design and implementation of the training program was less commendable.

(5). Overall appropriateness of the costs and cost structure and use of resources within the three projects.

The evaluators of these three projects, being trained foresters, and therefore not very familiar with accounting details, did not have complete financial records available to them; so it is not appropriate for them to make extensive remarks in the realm of fiscal responsibility. However, it is difficult to look at projects such as these without forming some quick impressions regarding possible savings. And, once again, different opinions were formed for each project.

Evidence of PD 17/87(F) exists only in the form of documents – no buildings, plantings, or other monuments to be judged. All of the documents available on the project indicate that it was carried out in a fiscally responsible manner, without un-necessary expense.

When establishing the demonstration plot for PD 84/90(F), the managers made some decisions that resulted in expenditures that would have been unnecessary if alternative options had been chosen. For instance, the decision to place the plot itself at the site chosen required the construction, (re-building?) of 7 kilometers of un-useable logging road. And, although there is an existing nursery in the immediate area of the plot, a dedicated nursery, with accompanying office, residences, and support buildings, was built. These two items, (road and nursery complex), account for more than a third of the project budget. Choice of a site closer to existing Forest Research Institute facilities may have eliminated the need for road construction; and necessary planting stock may have been available with a simple expansion of capacity at the existing nursery.

When looking at the costs involved in PD 12/93 Rev.3(F), it is necessary to separate the two segments of the project. Only budget proposals, not actual expenditures, were available to the evaluators, and these were only estimates of what would have to be spent. Because the writing of the guidelines involved a contract, (which was assumed to be the product of negotiation), it is not within the purview of this report to comment on those costs. The costs of the training component, however, are fair subject for discussion. The plan for this aspect was reasonable, and called for training 90 students in three separate locales. However, the actual implementation was not very efficient. All three training sessions were held in Bogor, and the resultant travel expenses allowed only 77 participants. A much more economical approach would have had two or three instructors traveling to three training sites located more closely to the students.

It is recognized that there are many factors involved in planning and carrying out these projects of which the evaluators are not aware. Therefore, it is not our intent to unduly find fault or criticize the choices that were made. Given the information available to us, these thoughts were only natural.

Recommendations.

(a) Consider the need for similar projects in the future.

The fine work accomplished under PD 17/87 (F) will serve forest workers in Indonesia, (and possibly neighboring countries as well), for many years. The documents it produced should be made available to a wide range of disciplines. It must be realized that the work was done more than 12 years ago. There may be advantages in trying new techniques to monitor subsequent events; especially in light of the 1998/98 event, which may have been almost as severe as the 1982/83 event that was the subject of the project.

All of the evidence encountered during the evaluation of PD 84/90 (F) leads one to the conclusion that the concept was a good one, and that the demonstration plot could have served a useful purpose if it had survived. For this reason, it is suggested that a donor be sought to sponsor a renewed effort, taking into consideration some of the suggested design changes. If the project is repeated, it is important that it be institutionalized into the ongoing work of the Ministry of Forestry; otherwise it will cease to function when the project funds are gone.

There is no need to repeat the creation of guidelines as done under PD 12/93 Rev. 3 (F), but efforts must continue to seek implementation of their concepts by the GOI. Regarding the training part of this project, it should be carried out under a totally new project, a major component of which must be a "training needs" analysis. There is strong evidence that neither the jobs/skills of the students, nor the content of the training had been thoroughly considered before the sessions were held. Fire management is an area of expertise

requiring progressive training over time, and this should be tied to career expectations of the students and the future needs of the Ministry.

There is a need to consider a separate project dedicated to developing the concept of community forestry. This type of activity has been emphasized in a number of reports. Forest fires in Indonesian forests are mostly manmade, and therefore the solution ought to be sought involving local communities.

(b). Objectives of such future projects.

If the ITTO is to sponsor such future projects, that organization will set the objectives; however, it is assumed that these would be aimed at conserving all the forest resources, (non-timber as well as timber), of all forests in Indonesia, commensurate with the needs of the people. Of highest priority should be projects that assist in further development of the forest fire management infrastructure, and its institutionalization within the GOI.

(c). Innovative approaches/designs for projects aimed at promoting forest fire prevention and rehabilitation of areas affected by forest fire in the tropics.

As shown by the past several years of involvement by a number of forest fire experts from other countries, the Indonesian forest professional is receptive to ideas from outside. It may be wise for those professionals to develop more of their own ideas on dealing with fire management issues that are unique to their own country. There are advantages to taking tried and true concepts, and converting them to one's own conditions. A fine example of this is the way the "Smokey Bear" forest fire prevention program from the United States has been converted to the "Si Pongy" program in Indonesia. There is also ample evidence, of the ability of Indonesians to develop their own ideas and programs without mimicking those of another. This should be encouraged.

(d). Scope and contents of ITTO's activities to address forest fire issues in the tropics.

Fire management issues will increase in importance for the conservation of the tropical timber resource worldwide. The popular misconception that rainforests cannot burn has been seriously discredited in recent years; and this trend can be expected to accelerate as the cycle of opening virgin forest and subsequent drying of the land introduces fire into new areas. ITTO is well-placed, and has the resources, to be an important catalyst in fire management. A good place to start in other regions would be to encourage the use, by offering project support, of the "ITTO Guidelines on Fire Management in Tropical Forests" in member countries that do not presently have workable fire management programs.

(e). Target groups: Countries, government, organizations, forestry sector and local communities.

Each of the groups mentioned above has a stake in conserving the tropical forest resource. As such, they should all be receptive to efforts to help with fire management programs. ITTO may want to seek out appropriate representatives of these groups to instill active interest in addressing the fire problems in their spheres of influence. Because ITTO's resources are finite, it may be well to widen the circle of partners sharing the financial burden of the needed projects.

(f). Organizational arrangements of the projects.

It is probably appropriate that all ITTO funded projects related to fire management issues be operated under the auspices of the Ministry of Forestry, especially now that the Directorate of Forest Fire Control is in place. This is because that agency has responsibility for all the fire management aspects, and will have a stake in the success of these projects. It is also appropriate that the Ministry use sub-contractors to handle tasks, such as training, when it lacks the expertise to do the job with its own resources.

(g). Follow-up and evaluation practices.

Recognizing that there are many factors affecting when and how evaluations are carried out, it may still be appropriate to make the point that such evaluations are more likely to be effective if done soon after completion of the project. In the case of both PD 17/87(F) and PD 84/90(F), so much time had transpired

that it was difficult to find people to interview who actually had first-hand knowledge of what was done, and why it was done. And it is certainly worthwhile to include a mix of experience in the evaluation team, both in terms of nationality and professional background/experience. In the case of these evaluations, it was valuable to have American fire expertise complemented by Indian silvicultural expertise.

(h). Supplemental, alternative activities, processes, procedures, and/or follow-up programmes in the field of forest fire prevention and rehabilitation of areas affected by forest fire, if appropriate.

The evaluators agreed that there was an opportunity to learn from the unfortunate experience of the demonstration plot in PD 84/90(F), and that this could be done by requesting donor support for re-establishing a similar effort. As mentioned above however, any demonstration plot will require maintenance for longer than the two years set out in PD 84/90. Therefore, it will require commitment on the part of the Ministry of Forestry to support it beyond the scope of a new project.

The training component of PD 12/93 Rev. 3 (F) had much merit; but it should have been managed as a separate project, with more planning, if it were to do any good. This is certainly worthy of consideration as an ITTO project, because the success of all other fire management activities is contingent on well-trained personnel to carry them out.

(i). Further actions needed to sustain or increase the intended effects on integrated forest fire management and to draw conclusions which may be of relevance to other ITTO projects in this field.

It is not self-serving for fire management personnel to remind others that so much in forestry is dependent on protecting the resource from fire. Forestry investments, even for fast-growing tropical species, have a high risk component; and the threats from fire are becoming more significant every year. It is important that efforts in fire management be increased before too much more of this resource is lost. It is important for ITTO to fund projects that will result in genetic improvement of some tree species. But it should also be recognized that, unless that genetic improvement involves a high degree of fire resistance, the funding may be wasted without commensurate investment in fire management improvements that will protect the new tree.

Specific Remarks for Individual Projects.

It has already been stated that the three projects, although spread over a fairly long period of time, actually constitute a rational continuum because one logically proceeded from the one preceding it. Thus, it was proper to present the "synthesis report" that has just been given. However, each project had its own goals, difficulties, and measures of success/failure. Therefore, it is also helpful to look at each project, and include much the same areas of evaluation as did the combined activity report. The following pages briefly cover the elements that were evaluated for each individual project.

ITTO PROJECT PD 17/87(F)

“INVESTIGATION OF THE STEPS NEEDED TO REHABILITATE THE AREAS OF EAST KALIMANTAN SERIOUSLY AFFECTED BY FIRE”

Background Information About the Project.

East Kalimantan is the province of Indonesia that produces most of that country's tropical timber. In 1982/83 a very serious drought struck the Southeast Asian region. Initiated by shifting cultivation practices, forest fires destroyed huge parts of the tropical rain forests. In East Kalimantan, 3.2 million hectares burned, of which 2.7 million hectares consisted of tropical rain forest.

Because droughts and forest fires of a limited extent appear periodically, it was important to know why the forest fires of 1982/83 were so extremely severe; and what could be done to rehabilitate lands damaged in those fires, as well as those of future years. To this end, Project PD 17/87(F), “Investigation of the Steps Needed to Rehabilitate the Areas of East Kalimantan Seriously Affected by Fire”, was approved by the International Tropical Timber Organization and the Government of Indonesia.

The study began in June of 1988, with an estimated duration of twelve months; however, it was recognized that it would necessarily be followed by at least one companion project to implement the identified remedies. That project was PD 84/90(F), “The Establishment of a Demonstration Plot for Rehabilitation of Forest Affected by Fire in East Kalimantan”.

The Executing Agency for this project was the Agency for Research and Development of the Ministry of Forestry, and it was assisted in its work in Samarinda by the Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ) under contract to the Government of Indonesia.

Efficiency and Operational Aspects.

Project managers were able to take advantage of many existing facilities to implement the study. A number of scientific studies had been carried out by various investigators, and the reports of these studies were available, which avoided redundant work.

Effectiveness.

The purpose of the Project was to investigate steps needed to rehabilitate the areas of East Kalimantan seriously affected by fire, and it can be said that this purpose was fulfilled. The project managers looked at every conceivable aspect of the damages, and correctly reached the conclusion that most, if not all, of the necessary techniques are already known to forest workers.

Impacts and Effects.

The impacts and effects of this project are both immediate and long term. Just by undertaking the investigations required in the terms of reference, the project managers brought the severity and breadth of the fires' damage to the consciousness of many people and organizations who may not have otherwise become involved in the necessary solutions.

Through the development of the Plan of Action, project managers identified existing laws that could be used for carrying out the rehabilitation, and named the organizations that could do the actual work. These organizations spanned the entire spectrum of those affected by forests, including state, regional, and private corporations; communities, and even the military.

In the long term, the proposal to establish a Demonstration Area and a Pilot Program, would have extended the value of this Project for many years. However, the pilot program was never funded; and the Demonstration Area suffered two mortal setbacks that ended its potential in this regard. The severe fires of 1997/98 burned over almost the entire area; and government re-allocation of land ownership/use allowed local people to move onto the site.

Conclusions.

The following statements address the extent by which the Project succeeded in meeting its established goals.

(a). Relevance, effectiveness and applicability of the action plan proposed by the Project.

A "Plan of Action" laid out specific tasks to be accomplished, and identified who was to carry out these tasks. They included a broad spectrum of organizations affected by forests, including state, regional, and private corporations; communities, and the military.

The plan recognized that different techniques would be necessary for different situations, including tree species and soil types, as well as degree of damage from fire, and land-use categories. Several "decision matrices" were created to assist managers. Included in that plan was an analysis of the monetary costs of rehabilitation compared to the monetary benefits of the same.

(b). Feasibility of the methods for rehabilitation of forests with different degrees of damage recommended by the Project

The above referenced action plan, after detailing the existing situation, described a plan for rehabilitating burned areas, based on numerous criteria. The suggestions drew heavily on research in the silviculture of tropical forest species, and took care to fit the techniques to the locales to be rehabilitated in East Kalimantan.

The ultimate judgment as to the feasibility of some of the methods could have been made only after the demonstration area and pilot project had been in place for a number of years, because that effort was in itself a form of research into a new field. Due to the unfortunate developments explained above, (destruction of the demonstration area by wildfire), this judgment became impossible.

(c). Effectiveness of the information dissemination of project results.

This was the major weakness in the project. This project handed off the educational aspects of the work by suggesting a demonstration area and pilot project. However, neither of these sub-projects incorporated meaningful plans for technology transfer or public education --- other than what happens when people (who are already interested in the work) physically visit the sites. A specific technology transfer effort was definitely called for to make this rehabilitation project complete.

Twelve reports and four activity reports were the main outputs from this project. It is obvious that these reports are the results of hard work by short-term experts and consultants. However, the results of these important studies remained largely confined to the project offices, and it seems that there was no systematic effort to disseminate them to various stakeholders. The findings of these reports are of great significance to academia, NGO's, industry, government, and to the forest-dependant communities. Intensive extension efforts would have helped sensitize the different stakeholders to ultimately use their support to evolve a national action plan to mitigate the damage caused by man-made forest and land fires.

(d). The current overall situation of the project.

The subsequent success/failure of the Project was to have been determined after the implementation of the Demonstration Area. The fact that the demonstration project was an ultimate disappointment should not detract from the work that was done while completing this project.

While project managers and some other Ministry of Forestry personnel continue to be alarmed about the rapid depletion and destruction of valuable forest resources in this important province, there appears to be no commensurate anxiety on the part of the other stakeholders. This should be corrected by undertaking extensive publicity efforts throughout the region.

(e). Unexpected effects and impacts of the Project.

Because this project was essentially a study followed by a list of proposed activities, it was not likely to cause unexpected effects and impacts. However, it may be said that the concepts developed during its duration helped to initiate work on the national guidelines for protection of the forest against fire, which became PD 12/93 Rev.3(F). This in turn has led to the beginnings of a forest fire management unit within the Ministry of Forestry.

(f). Implementation efficiency, including technical, financial and managerial aspects.

Project managers took advantage of many opportunities to maximize the efficiency of the work. This included reviewing existing literature on rehabilitation of tropical forests after fire damage; acquiring and using maps of the various agencies and companies who work in the area of the study; and soliciting information from residents and workers in the area.

Recommendations.

- Institutionalize the findings of the investigation, and disseminate them to interested groups:
 - Academia,
 - Non-government organizations,
 - Concessionaires,
 - Government agencies, and
 - Forest-dependent communities.
- Develop an extension program to work with school groups and community leaders to foster the need for fire prevention in the region.
- Explore the feasibility of establishing a Community Forestry program in the region.
- Organize field-level fire management units within the Directorate of Forest Fire Control of the Ministry of Forestry.
- Consider a donor-sponsored project of 4 to 5 year duration of fire management training for supervisors, field workers, concessionaires, NGO's, community leaders, and others.

ITTO PROJECT PD 84/90(F)

“THE ESTABLISHMENT OF A DEMONSTRATION PLOT FOR REHABILITATION OF FOREST AFFECTED BY FIRE IN EAST KALIMANTAN” [PHASE II OF PD 17/87(F)]

Background Information About the Project.

In 1982/83 a very serious drought struck the Southeast Asian region, and forest fires destroyed huge parts of the tropical rain forests. In East Kalimantan, 3.2 million hectares burned, of which 2.7 million hectares consisted of tropical rain forest.

Because droughts and forest fires of a limited extent had appeared periodically, it was important to know why the forest fires of 1982/83 were so extremely severe; and what could be done to rehabilitate lands damaged in those fires, as well as those of future years. To this end, Project PD 17/87(F), “Investigation of the Steps Needed to Rehabilitate the Areas of East Kalimantan Seriously Affected by Fire”, was approved by the International Tropical Timber Organization and the Government of Indonesia. That study began in June of 1988, with an estimated duration of twelve months. It was quickly recognized that at least one companion project would be necessary to begin implementation of the identified remedies. The first such project was PD 84/90(F), “The Establishment of a Demonstration Plot for Rehabilitation of Forest Affected by Fire in East Kalimantan”.

The Executing Agency for this project was the Agency for Research and Development of the Ministry of Forestry, and it was assisted in its work in Samarinda by the Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ) under contract to the GOI.

Efficiency and Operational Aspects.

Project managers were able to take advantage of the fact that many of the steps in the development of the Demonstration Area had already been done during the implementation of PD 17/87(F). A literature search had identified species choice and silvicultural techniques that were most likely to yield success; a manual for conducting an inventory of the area had been written, and likely sites had been identified. Much was already in place to facilitate implementation of the Project. And, significantly, there was strong support for the project by government, communities, and the private forestry sector.

Effectiveness.

The purpose to the Project was to find the best method in economic, ecological and social terms to rehabilitate forest areas damaged by fire, which could be applied for different forest conditions; and to develop an area to be used to demonstrate this method, as well as for forestry research and training purposes. Report No. 6 of PD 17/87, after detailing the present situation, described a plan for rehabilitating burned areas, based on numerous criteria. The suggestions drew heavily on research in the silviculture of tropical forest species, and took care to fit the techniques to the locales to be rehabilitated in East Kalimantan.

There is no question that the project managers had successfully set up a demonstration area as specified. There is much evidence to show that the methods being demonstrated there were chosen after careful evaluation of the literature describing existing research. Whether these methods meet the criteria of being the best in economic, ecologic, and social terms, as required by the agreement, could have only been learned over time.

This demonstration area was basically a research plot consisting of two silvicultural treatments; one tending a naturally regenerated stand; and the other a trial of indigenous/endemic fast growing and valuable timber species of natural forests, as well as some proven exotics. These treatments were decided upon after a literature review, and were influenced by the research experience of the executing agency. Evaluation after ten years should have definitely demonstrated the effectiveness of both these treatments to rehabilitate fire burnt areas. However, because of the fires in 1997-98, the area now provides only a devastated landscape, and therefore determination of the effectiveness is out of the question.

The Demonstration Area had already shown its value as a tool for training and research before the fires. There is an excellent opportunity to develop an even better learning tool than before, if the proper attention is paid to correcting the mistakes made in the earlier project.

Impacts and Effects

The impacts and effects of this Project are both immediate and long term. Just by implementing the actions required in the terms of reference, the Demonstration Area brought the severity and breadth of the fires' damage to the consciousness of many people and organizations who may not have otherwise become involved in the necessary solutions.

This Demonstration Plot was a follow-up of PD 17/87(F). The main objective of the plot was to evolve a suitable silvicultural package for the rehabilitation of fire-devastated tropical rain forest; and was intended to provide lessons to different stakeholders of its replicability elsewhere. However, the limitation of only two years for carrying out the techniques was too short. Forestry practices applied over a tract of 1000 hectares need to be maintained for about 10 years, (minimum of 5 to 6 years), with uniform applications throughout. At the end of the two year life of the project, the maintenance of the demonstration plot became difficult for the academic institution, Forest Research Institute, Samarinda. An area of 1000 hectares is too large to be managed by a research institute, especially when dealing with fire prevention and the encroachment of a transmigrating population in the vicinity, when funding for the project is no longer available. In spite of the best efforts of the Institute's staff, they could not control fire or encroachment on such a large, rugged landscape.

Conclusions.

The Project was to address terms of reference which would guide the workers toward the project goal. The following comments address the overall success of the project.

(a). Current status of the Demonstration Area.

The Demonstration Area was burned over in the fires of 1997-98, and the pressure of the local population claiming rights over the land aggravated this problem. The encroaching population may have been a potential cause for forest fires, which would strengthen their claim for extending the lands they cultivate.

Of the total 1000 hectares of land in the demonstration area, less than 50 remain unburned. This unaffected area exists in two small tracts. One is a plantation of fast-growing species near the site of the nursery, which was protected from fire by being bounded on three sides by a perennial stream. The other is a 5 to 6 hectare plantation near an area of transmigrating encroachment. The balance of the landscape looks as devastated as it might have been at the beginning of the project.

The nursery and office site complex is in total disarray. The guest house/office building has been allowed to deteriorate; windows and doors are gone, and trash is everywhere. The dipterocarp seedling beds are overgrown with weeds; and the hillside nursery for fast growing species is hardly recognizable as such. Boards have been removed from the bridge leading to the demonstration planting behind the office, so that foot travel across the stream is hazardous. The water tower above the hillside nursery is still in place, and even appears to be operable, albeit with no facilities to serve.

Initial work on the project involved improving 6.75 km of an existing logging road that was said to be unusable; along with new construction of another 5 km of lower standard road. This road is still in place, and is being used by local populations to access the area, but it only extends approximately 7 km, to the entrance to the project nursery. Access to the rest of the demonstration area can only be gained by use of the original road. That road is of extremely low quality, and it is unlikely that any person or group of potential visitors to the demonstration area would willingly experience the slow, rough, and tedious ride to study the lessons of the project.

(b). Applicability of the silvicultural options adopted in the Demonstration Area for addressing the rehabilitation of forests affected by fire in East Kalimantan.

The planting of some fast growing species, (some Dipterocarps; Acacia mangium, Gmelina arboria, Peronema canascens), can be rated as successful. These experiences could definitely be replicated in similar areas elsewhere. However, the other parts of the silvicultural package could not be seen. This may be due to the consecutive fire years of 1997-98, which could have obliterated the effects.

(c). Effectiveness of dissemination of Project results through training and extension involving the private sector.

The project resorted to only one strategy of rehabilitation employing a suitable silvicultural package as given in (b) above. Because the project's implementation efforts received the setbacks due to two years of fires; and much of the land was being claimed by local communities, the extension of the results among other stakeholders was not attempted. In fact, the staff of the project office and nursery were withdrawn from the site.

(d). Overall post-Project situation in the Demonstration Area.

The area has been totally burned, leaving only the two planted sites mentioned in (a) above. The nursery sites and buildings constructed by the project have been abandoned, and a large part of the landscape bears a devastated look. The demonstration area is too large to be handled by only one strategy, and for only the short period of two years.

Concerted and participatory effort by the Forest Research Institute's Wanariset Center, along with the involvement of local communities and Dinas Kehutanan, could restore the demonstration area if funding were available for 4 to 5 years.

(e). Implementation efficiency, including the technical, financial, and managerial aspects of the Project on a larger scale.

Project managers took advantage of many opportunities to maximize the efficiency of the work. This included reviewing existing literature on rehabilitation of tropical forests after fire damage; acquiring and using maps of the various agencies and companies who work in the area of the study; and soliciting information from residents and workers in the area.

Considering the fact that the 1982/83 drought and fire affected an estimated 3.2 million hectares of forest in East Kalimantan, it was proper to ask if the Demonstration Area of 1000 hectares could possibly provide sample techniques for other workers to apply over the whole range of sites in the Province. The documents available to the evaluators did not include detailed reference to selection of the site, but it is unlikely that the even 1000 hectare block of land contains a full range of the soils/aspect/topography/species composition traits to be experienced throughout East Kalimantan.

Having made that point, it must be admitted that consensus among the evaluators and the professionals they interviewed, (with one exception), was that 1000 hectares in this case was too large. This may have been more an issue of "design" rather than magnitude however, because a demonstration area needs to be accessible to those who would witness its examples of techniques. The area contains a fair range of different eco-units, but lacks roads and trails to allow ready access to those who would study it.

It is possible that the goals could have been better met by choosing several, smaller tracts of land, closer to the road, to allow more people to study and compare the alternative techniques of rehabilitation.

(f). Local institutional capacity to apply Project results.

The Forest Research Institute, Samarinda managed the project, but from a distance of about 100 km. The local research station of the Institute was not involved in the implementation, except when the project ended. Because the project has been partially successful, and the results are evident, especially the plantation of fast growing exotic, indigenous and endemic species, the same techniques can be applied and demonstrated elsewhere. If the research station managed the plantation and rehabilitation plots on a smaller scale of 25 to 50 hectares in one or two locations close by its facilities, it is possible that a true demonstration area could result.

(g). Extent to which Project built on experience gained during the implementation of PD 17/87(F).

This Project proceeded seamlessly from PD 17/87, so it can be said that it was truly just an extension of that project.

(h). Project's relative success to summarize the key lessons learnt

It was difficult for an academic institution to manage this 1000 hectare demonstration area. The topography is rugged, making access difficult. The pressure from the local people, first setting fire to the land, and then registering their claims to that land further aggravated the problem. Even under those difficult situations, the project managers carried out the plantings and silvicultural measurements. However, it cannot be termed successful in any large way; which is not to lay any blame on the Research Institute, the Ministry of Forestry, or the workers themselves.

Recommendations.

- Apply for a donor-sponsored project to re-vitalize the demonstration area with more accessible plots, of 25 to 50 hectares.
 - Assign management responsibility to the Wanariset Forestry Research Center, Balikpapan, because of its proximity to the site.
- Conduct a study to determine the true reasons for fires being set along roadsides and in concession areas.
- Organize local communities and involve them in development of management plans which will allow them to share in the benefits of properly protected forests.
- Explore the potential of agro-forestry to improve site conditions and reduce the threat of illegal logging.
- Seek a modification of policy on transmigration to reduce the impact of increased populations on the remaining unique tropical rainforest ecosystems that still remain.
 - Wherever these settlements have already been established, clearly mark village boundaries to prevent further intrusions into the forest.
- Consider absorption by the Forest Research Institute, Samarinda, of the soon to be closed Integrated Forest Fire Management program of GTZ.
 - Use this as a forum for research and training in fire management.
- Strengthen existing forestry research centers, and establish facilities for forest fire research.

“INTEGRATED FOREST FIRE MANAGEMENT IN INDONESIA – PHASE I: NATIONAL GUIDELINES ON THE PROTECTION OF TROPICAL FORESTS AGAINST FIRE (INDONESIA)”

Background Information About the Project.

The forest and land fire problem in Indonesia was evident in the fire seasons of 1982/83, 1987 and 1991. These extreme fire situations seem to occur during drought periods which happen every 4-5 years. The magnitude of the fire and occurrence is directly related to the length of the drought. The fires occur in forested and non-forested areas, in natural forests, in lands that have been selectively logged, in peat-swamp forest, and also in plantations. They occur most frequently in grass and scrub lands, and only infrequently in undisturbed natural tropical rain forests.

The increase of forest estate development and reforestation, and other activities such as transmigration and extension of agricultural plantation will continue to increase the potential of fire hazard. Efforts in forest fire protection so far have been minimal due to the lack of institutional capacity, personnel and lack of the guidelines at both the national and local level. The Ministry of Forestry has only a small number of staff trained and skilled in forest fire protection at the national level; and there are no units at the provincial level that have exclusive responsibility for forest fire protection. Forest fire research activities are limited.

The Government has taken some important steps in developing a system for forest fire prevention. These include the establishment of forest fire regulations for regional forestry services, personnel training in fire suppression and several cooperation projects with some donors.

Efficiency and Operational Aspects.

The original proposal in 1993 called for the project to be carried out by staff of the Director General for Forest Protection and Nature Conservation, Ministry of Forestry.

Difficulties with funding and determination of an appropriate implementing agency caused some initial delays. The situation was corrected in 1996, when an agreement was signed to involve the staff of the Bogor Agricultural University (IPB). This allowed the work to begin in earnest, and it was carried out in a manner consistent with what one would expect from an academic institution.

Assistance was sought from national and international consultants, and the format of the guidelines followed those suggested by the recently published “ITTO Guidelines on Fire Management in Tropical Forests”.

Effectiveness.

Evaluation of this aspect of the Project will have to await implementation of the recommendations by the government of Indonesia. The Guidelines appear to be very sound, and have had review by a wide range of experts in fire management; but the proof of their worth in Indonesia can only be measured when these proposals are put in place throughout the country.

Impacts and Effects.

There can be no doubt that the publication of the National Guidelines will have an impact in the area of forest fire management in Indonesia. The process of bringing together experts and interested parties from various public and private organizations to examine the forest fire problem has already led to heightened awareness of the need for improved techniques and institutions. The fact that the government has recognized the need to begin a serious attack on the fire problem will no doubt spark renewed interest in a wide range of forest-related issues that have been considered too risky until they can be reasonably free from the threat of fire.

Conclusions.

(a). The application of the National Guidelines on the Protection of Tropical Forest Against Fire, and possible constraints to the implementation of these guidelines in Indonesia.

It appears that the National Guidelines that were prepared under the provisions of this Project could provide a good framework upon which the GOI could build a workable forest fire management program. The final proof of that judgment can only be made after those guidelines have been implemented.

The first step that has been taken by the Ministry of Forestry to set the process into motion has been the creation of the Directorate for Forest Fire Control, with several sub-directorates and sections within it. If these units are allowed to develop the required programs, there is reason for hope that the Ministry will be able to start dealing with forest fires in a meaningful way.

There are several impediments to smooth adoption of the programmes detailed in the Guidelines, and these may not be easily overcome. One of these involves the fact that historically there are frequent personnel changes within many GOI institutions, and the Ministry of Forestry is no exception. This rapid turnover of both management and staff does not allow continuity of the length required to fully develop staff or programs, and see them through testing and improvement.

Another factor that was brought out to the evaluators is that the structure of government in Indonesia does not foster major programs that rely on strong central leadership. Differences in the way issues are handled at Provincial and district levels make it difficult to initiate national programs.

(b). The contribution of other Project outputs, including the curriculum for training & extension, the enhanced organizational capacity of institutions dealing with forest fire, and fire incidents monitoring system, to the development of an integrated forest fire management system in Indonesia.

Many of the documents produced subsequent to the development of the Guidelines appear to be capable of helping managers who try to implement them. However, most of the ones we saw were in Bahasa Indonesia, and the evaluators' lack of skill in that language prevented meaningful evaluation. Discussions with the authors of some of these led to the impression that they are, in fact, well written.

There is room for improvement in the training curriculum and extension efforts. The three-session training program demonstrated a lack of planning to make it meaningful. Before any more of these are attempted, it is recommended that a thorough Training Needs assessment be undertaken. This will result in a better view of who needs training, and what kinds of training they need.

(c). The effectiveness of information dissemination of project results and the contribution of the project outputs to addressing forest fire issues in the South-east Asia region.

The international conferences that were sponsored by the Project managers, as well as participation by them in ASEAN efforts to deal with smoke and fire issues, help to keep the issues in front of the forestry community. More effort should be expended to make the general public in Indonesia aware of the issues so that citizen support can be expected.

(d). The overall post-Project situation.

The Project supplied good tools to the GOI for dealing with the important issue of forest fire, and the Ministry of Forestry has made the first moves to use those tools. The fact that fire weather occurs in cycles can cause the momentum to be lost if managers allow it. Everyone is interested in forest fire management during the years of El Nino droughts; but several years of rains could lower that interest to the point that it will be necessary to begin this effort over again when fires start.

(e). Unexpected effects and impacts, either harmful or beneficial.

The evaluators witnessed no results that were not expected.

(f). Implementation efficiency, including technical, financial and managerial aspects.

Production of the Guidelines must be considered an academic, intellectual, and artistic enterprise. As such it is difficult to assess efficiency. However, the training aspects of the Project suggest some lack of economic efficiency. Instead of moving 90 students from one end of the archipelago to the other at considerable expense, it might have been better to have two or three qualified instructors travel to a few training centers close to the students.

(g). Relative success or failure to summarize the key lessons learnt; and issues or problems to be taken into account in designing and implementing similar projects in the future.

It appears that the Project managers dealt with all difficulties in a professional manner, and that they would be prepared to carry out similar work in the future. Everyone understands that the success or failure of the Project ultimately depends on implementation by the Ministry of Forestry.

Recommendations.

To effectively implement the National Guidelines, the following prioritized steps should be considered by the Government of Indonesia:

- Establish an upper level coordinating agency, with representatives from related agencies, academia, NGOs, public figures, media personnel, international experts, and donors.
- Treat forest and land fire as a national disaster, and continue to budget funds to deal with it as is now being done.
- Continue implementation of the National Guidelines under the auspices of the newly constituted Directorate for Forest Fire Control; and the fire management units at the province and district levels, as has been begun with the Forest Fire Brigades.
- Fund an infrastructure to support fire management, as was started with the 2001 Budget; and seek loans, donations, and grants from sources such as ASEAN, ADB, and the World Bank. In this search for funds, it may be wise to focus on work to be done in Riau and West Kalimantan, where Ministry of Forestry efforts are already underway.
- Establish a formal system for developing personnel who will make forest fire management the principal element of their professional careers; identify their skill development needs; and provide the necessary training.
- Continue to strengthen universities, other educational institutions, and training centers to prepare foresters and others to prevent, manage and suppress fires; as in the example of Bukit Tigapuluh National Park in Sumatera.
- Identify national and international experts who are skilled in fire management training.
- Emphasize the comprehensive national forest fire management plan, known as PP No. 4/2001, extending it down to the district level, and work for further socialization of this effort.
- Use extension methods to sensitize the public on the need for fire prevention.
- Consider application for additional ITTO projects to assist in the implementation of the various components of the national guidelines.

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