6. Project Design

6.1 Project Site

The target area of the Project is the 20 communes located within the watershed area of Hoa Binh Dam, Hoa Binh Province (Refer Annex 11-1). As mentioned under *Section 3.3 – The Provincial Context*, rehabilitation of forest cover in the watershed area of Hoa Binh Dam is of high national priority. The site is also suitable for technical cooperation project for several reasons. Hoa Binh is easy to access from Hanoi, which is suitable for demonstration[14]. There is also an advantage in conducting research activities in Hoa Binh, as FSIV's Hoa Binh Research Station for Environment and Protection Forest (hereinafter referred to as "the Hoa Binh Research Station") and its forest are located within the watershed area. Furthermore, the natural and socioeconomic condition within the watershed area is diverse, which allows the Project to develop technologies suitable for a wide range of conditions, leading to high applicability. All these conditions provide good reasons for implementing the Project in the watershed area of Hoa Binh Dam. As explained below, project activities will be implemented in various intensities within the target area, depending on the nature of the activities.

The facility and fields of the Hoa Binh Research Station in Cao Phong District, Hoa Binh Province, will be utilized for both experimental and demonstration purposes. An additional demonstration site will be established in Hoa Binh town, to ensure easier access that will be necessary for effective demonstration. For seedling production and related research activities, the Center of Breeding Plant in Hoa Binh Province (Hoa Binh Town) will be utilized.

On-farm trial activities will be conducted in 5 or 6 communes selected from the target area, based on the criteria established by the Project. Criteria will include aspects of natural conditions, socioeconomic conditions, organization and management capability, and accessibility. Two communes will be selected prior to the signing of R/D, to enable the project to initiate its activities soon after the inception. Candidates of the 2 communes are Binh Thanh Commune (Cao Phong District) and Hien Luong Commune (Da Bac District).

[14] The distance between Hoa Binh Town and Hanoi is 75km (1.5 to 2 hours by car).

6.2 Target Beneficiaries

The ultimate project beneficiaries will be the users of the information compiled and the techniques developed by the Project. More specifically, the users will include local farmers who have been allocated or contracted forestland, Song Da WMB, Song Da FE, and AFE. In addition to the target beneficiaries mentioned above, the organizations directly involved in project implementation will also benefit through on-the job training, and by fulfilling their respective roles and responsibilities.

6.3 Long Term Direction and the Overall Goal

The long-term direction is the ultimate goal the Project aims to contribute to. The long-term direction of the Project has been determined in line with the *Forest Development Strategy 2001 – 2010* and the 5 Million Hectare Reforestation Program (661 Program).

LONG-TERM DIRECTION:

> *Forest coverage is increased, and the environmental and economical values of forests are improved.*

The overall goal states the desirable situation, or the positive impact, which is expected as a result of achieving the Project Purpose. The Overall Goal of the Project reads as follows:

OVERALL GOAL:

> *Sets of technology for natural forest rehabilitation developed by the Project are applied by policy makers and by end users.*

Application of the newly developed technology is considered to be the overall goal of the Project, which is expected to be achieved after successful project completion[15]. As stipulated in the Project Design Matrix (PDM: Refer Annex 1), indicators to verify the successful achievement of the overall goal include concrete actions at the policy level leading to the improvement of the technical guidelines of 661 Program, as well as the practical application of the newly developed technology in the 20 communes of the critical watershed area of Hoa Binh

[15] The goal is to enable 661 Program to adopt improved methods and procedures for its implementation. However, as explained in the next page, the Project sets its purpose (i.e., the target to be achieved within the 5-year duration), on the development of the sets of technology. Integration of the technology into the 661 Program is considered to be the overall goal, which is expected to be achieved after the project completion, which also requires strong GOV commitment.

Dam.

6.4 Project Purpose

PROJECT PURPOSE:

Sets of technically appropriate and economically affordable measures for natural forest rehabilitation are developed that can be used by forest enterprise, watershed management board, and extension workers.

Achievement of the Project Purpose can be verified by the submission of recommendations to the 661 program based on the project results, as well as the publication of manual(s) on hands-on techniques that can be used by local technical officers and farmers. Furthermore, a number of technical officers of the Song Da FE and Song Da WMB, and staff of the AFE should also be already trained in the target area on the newly developed technology[16].

6.5 Outputs and Activities

The outputs of the Project include three important subjects: (1) Systematic compilation, maintenance, and distribution of information related to natural forest rehabilitation; (2) Development of silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field; and (3) Establishment and implementation of monitoring and evaluation system. Details of each output, and the activities necessary to achieve the outputs, are elaborated below.

OUTPUT 1:

Information on technology, results from other projects, manuals, and valuable experiences regarding natural regeneration, soil conservation measures, upland farming, forestry related policies and people's participation in watershed area is compiled and systemized.

[16] Numerical target should be determined by the stakeholders at the inception of the project implementation.

ACTIVITIES:

1.1 Collect and analyze written documents.
1.2 Conduct field visits to advanced projects and good examples.
1.3 Identify prominent species and methodology for the natural regeneration experiment and on-farm trials.
1.4 Publish leaflets on hands-on techniques targeting local farmers based on existing information and share with other projects.
1.5 Establish web-based database for collected information.

Past studies reveal that there is a wealth of useful research results, information and experiences accumulated by research institutes in Vietnam, as well as by projects supported by international organizations. Main hindrances appear to be in the difficulty in systematic compilation, maintenance, and in the dissemination of such information to forest management practitioners. Existing information is either not reaching these potential users, or is not being consolidated in a user-friendly form easy for application. Furthermore, research results have not been reflected in forestry related policies effectively. Output 1 aims at tackling these issues. Output 1 also provides the basis for Output 2, in identifying priority research needs on natural forest rehabilitation.

It is also important to note that Output 1 will extend its focus beyond information *directly* concerning natural forest rehabilitation, to cover important issues *related* to the subject, such as soil conservation measures, upland farming, forestry related policies and people's participation in watershed area. This is based on the understanding that the impact of the newly developed technology on natural forest rehabilitation will be limited in the long term, unless these issues are adequately addressed.

As elaborated in Annex 2, activities under Output 1 are mostly concentrated in the early stage of project implementation (mainly in the 1st year). This will enable the early start of activities under Output 2, which will be designed and initiated based on the analysis and assessment of existing information. It is important, however, for the Project to maintain (regularly update) the database as new information become available, both from the Project activities and from other sources.

Achievement of Output 1 can be verified by: (1) establishment and regular maintenance of the web-based database; (2) publication of information based on existing technology; and (3)

compilation and timely dissemination of information on technologies that become available from the Project and from other organizations throughout the project duration (refer Annex 1).

OUTPUT 2:

Techniques on silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field are developed through research and on-farm trials.

ACTIVITIES:

2.1 Establish a demonstration site and on-farm trial activity sites to apply and verify currently available techniques.
2.2 Design research and on-farm trials on silvicultural measures for natural forest rehabilitation and farmland management.
2.3 Conduct and analyze research on native species seedling production.
2.4 Conduct and analyze research on silvicultural measures for natural forest rehabilitation.
2.5 Conduct and analyze on-farm trials on silvicultural measures for natural forest rehabilitation and farmland management.
2.6 Share the project results with relevant organizations.

Output 2 consists of three main components: Implementation of demonstration and on-farm trial activities to verify existing techniques (Activity 2.1); Research and on-farm trials (Activities 2.2 – 2.5); and Sharing of project results (Activity 2.6).

Activity 2.1 assures the early start of the Project's field trial and demonstration activities based on existing technology, without waiting for the new findings that would become available at the later stage of project implementation. The activity will be implemented at the demonstration site in Hoa Binh Town, which will be secured prior to the signing of the R/D, and in the 2 communes identified prior to the signing of the R/D (refer section 6.1). In addition to the purpose explained above, the on-farm trial activities during the 1st year have an additional and equally important objective, which is to assess the problems and constraints of the 661 Program at the operational level, both in terms of *implementation procedures* and on *technical matters*.

Research and on-farm trial activities (Activities 2.2 – 2.5), the core component of Output 2, will be designed and implemented based on the findings from the baseline survey, which will be conducted during the 1st half of the 1st year (refer Plan of Operations: Annex 2). Baseline survey is critical for good understanding of the local situation, and for identifying the needs of forest management practitioners (including local farmers). Based on situation analysis and needs assessment, priority research areas will be identified in the fields of native species seedling production, and silvicultural measures for natural forest rehabilitation (for details refer Annex 2). Research will be conducted with the overriding goal of developing sets of technologies for practical application in the field.

In the baseline survey, natural and socioeconomic conditions of the target area will also be assessed, in order to determine specific sites for on-farm trial activities. On-farm trial is an important component of the Project, through which the technical appropriateness and adaptability of the technologies will be verified. On-farm trial activities will be coordinated by Sub-DFD, involving researchers of FSIV, technical officers of FE and WMB, and AFE workers. These activities are to serve as On-the Job Training (OJT) for the technical staff, who are involved in forest management and/or in forestry extension activities for local farmers. On-farm trial activities by these organizations are also aimed to show practical and workable examples on how research institutes and extension organizations can work together at the field level, to improve the value of their services.

Importance of addressing the issue of upland farming became clear from village surveys and stakeholders' workshops (refer Annex 16). While this Project does not place upland farming as its core problem, it aims to contribute to address this issue by incorporating activities on farmland management into the on-farm trial activities, which may include soil conservation measures, farm forestry, farm budgeting, agroforestry, etc.

The Project should make the best use of existing groups and organizations in the villages, such as farmers' association, in the process of selecting farmers who will participate in on-farm trial activities[17]. Close coordination with these organizations would support the project's effort to disseminate new technical knowledge to local farmers through existing channels. While the Project does not have a specific component on institutional capacity building, the Project is expected to have a positive influence in improving their capability through its interaction with village groups and organizations.

[17] The baseline survey of the Project should examine institutional capabilities of village organizations and groups, since the situation may differ from village to village.

Activity 2.6 is a critical activity which will ensure the sharing of project results with technical officers of FE and WMB, AFE workers, local farmers from the target area, and donor organizations, through seminars and field visits. Information will also be shared with a wider audience by means of publications and web-based database (refer Output 1). At the final stage of the Project, results should lead to the submission of recommendations to 661 Program.

In view of the long-time nature of forestry research, the verifiable indicators should be determined to be realistically achievable targets. As elaborated in the PDM (Annex 1), indicators of Output 2 call for at least one experimental site established for each of the silvicultural measures stated in the PO, that have potential for field application. Furthermore, there should be certain number of on-farm trial plots established involving local farmers in the selected communes, while the specific numerical target must be determined at the inception of the project. There should also be at least one silvicultural measure for natural forest rehabilitation identified that can be applied under plantation, additional planting, and natural regeneration operations of the 661 Program. These targets should be achieved by the end of the project duration.

OUTPUT 3:

Monitoring and evaluation system for the overall project implementation and for the respective research and trial activities are established and implemented.

ACTIVITIES:

3.1 Based on Output 1 and baseline survey (activity 2.2.1.), refine the Plan of Operations and the indicators for project purpose and outputs described in the PDM.
3.2 Design and conduct Monitoring and Evaluation (M&E) System for the overall project implementation and for the research design and on-farm trial activities.

Output 3 is the component of the Project that focuses on monitoring and evaluation. Activity 3.1 sets the starting point of the M&E activities. This activity has been included to allow the stakeholders to review and improve the PO and the indicators of the Project at an early *stage of its implementation when more information has become available, so that the project* activities can become more realistic and relevant to the actual situation. The Project Management Unit (PMU) will take the responsibility of undertaking this activity. Should there

be any revisions necessary on the PO and the indicators, such revisions will be made following the procedure required by JICA. The proposed changes on the POs and the indicators should also be approved by the Project Steering Committee (PSC).

M&E systems will be established to monitor the overall project implementation, as well as the technical aspects of specific project activities. The M&E should not be a formality. Rather, it should be operated as a useful mechanism, so that the M&E findings and recommendations can be fed back to the project implementation, and used to improve the experimental design and on-farm trial methodologies.

6.6 Inputs

Inputs required for the implementation of the Project are summarized in Table 6. Detailed descriptions concerning personnel can be referred to in the Terms of Reference (Annex 6 and 7). Quantity and specifications of machinery, equipment and materials required for the project will be planned based on the list that would be submitted by the GOV prior to the signing of R/D.

The profession of the three long-term experts that will be dispatched from Japan will include Natural Forest Rehabilitation, Silvicultural Technique Development, and Participatory Forest Management. Number and technical fields of short-term experts will be determined based on the annual implementation plan of the project, as well as the budgetary condition of the GOJ. For the first year, 3 to 4 short-term experts are expected to be dispatched in the technical fields described in Annex 7-2. The specific tasks of these experts are also stipulated in the Annex.

As for the Vietnamese Project Personnel, names and positions of the Research Manager and Research Coordinator have been identified (refer Annex 8), as well as the Provincial Manager (Director of Sub-DFD). Other project personnel will be specified prior to project inception. In addition to the core project personnel listed in Table 6, it is expected that researchers and extension workers will participate in the implementation of project activities, such as researchers from FSIV, technical officers from DARD and Sub-DFD in Hoa Binh Province, Song Da FE, and Song Da WMB, extension workers from Hoa Binh Province AFE Center, District AFE Stations, commune extension workers, and nursery workers (Annex 8, 9 and 10).

In cases where local expertise is required for implementing specific activities, and when such expertise is not available from within the project implementation agencies (e.g., DFD,

FSIV, and Sub-DFD), local consultants may be employed for a short term from other organizations, including NGOs. Costs for hiring local consultants will be borne by GOJ.

Table 6 Inputs required for Project Implementation

Vietnamese Government	Japanese Government
■ Project Personnel National Level 1. Project Director (Deputy Director of DFD) 2. Research Manager (Deputy Director of FSIV) 3. Project Coordinator (Staff of DFD) 4. Research Coordinator (Researcher of FSIV) Provincial Level 1. Provincial Manager (Director of Sub-DFD, Hoa Binh Province) 2. Provincial Coordinator (Staff of DARD or Sub-DFD, Hoa Binh)	■ Long Term Experts (3), including 1. Chief Advisor 2. Coordinator 3. Technical Expert.
■ Office Space, Facilities, Equipment and Materials • Office Space (DFD, FSIV, and Sub-DFD in Hoa Binh) • Space for installation and storage of equipment • Electricity, telephone line, water supply, etc.	■ Short Term Experts, in the fields of: • Experimental Design • Forest Soil • Socioeconomic Survey • Seedlings and Nursery Experiment • Pests and Diseases Management • Non-Timber Forest Products • Agroforestry / Farm Systems • Monitoring and Evaluation • Other technical fields if needed.
■ Administration and Operational Cost	■ Training of Vietnamese Project Personnel in Japan and/or third country
	■ Machinery, Equipment and Materials
	■ Local costs for establishing experimental and demonstration sites.

6.7 Important Assumptions and Risk Analysis

Important assumptions for Project's success are summarized in the PDM (Annex 1), and the Risk Analysis concerning these assumptions is presented in Table 7. Among the risk factors, there are some that could be mitigated by incorporating certain measures into the project design. Such measures have been reflected in the PDM and PO.

In addition to the above measures, the GOV and the Project should carefully study and monitor economic conditions and trends of the locality. While it is beyond the Project's scope, the Project should also make an effort in networking with other programs and projects (including projects by government, NGO, and international organizations) and with government

departments and institutes, to explore opportunities for collaboration and to identify potential resources that could support in improving local people's capabilities to overcome economic hardship.

Table 7 Risk Analysis

Risk	Possible Risk Mitigation Measures
From Project Purpose to Overall Goal	
1. Sets of technologies developed by the Project are not effectively shared with forestry officers, extension workers, and community leaders in the 20 communes. Implication: ⇒ Wide application of newly developed technology would be hindered.	1-1 Explore possibilities to support in-country training courses as a follow-up to the project. *1-2 Include technical seminars and field visits in the Project design, targeting technical officers and local farmers from the 20 communes.*
2. Economic conditions of the local people who participate in forest management falls below the current condition. Implication: ⇒ Wide application of newly developed technology would be limited if local farmers' suffer economic hardship.	2-1 Explore possibilities of introducing additional support, either via national programs or by other channels (i.e., NGOs, international volunteers, etc.) focusing on income generating activities or other means of livelihoods support. *2-2 Include farmland management (e.g., soil conservation, agroforestry, etc.) in on-farm trial activities of the Project, to assist local farmers to gain sustainable return from farming.*
From Outputs to Project Purpose	
• High inflation rate affects the economic affordability of technical measures developed by the project. Implication: ⇒ Technologies developed might become too costly for the farmers to adopt.	• Monitor the situation of national and provincial economy, and re-examine the cost norm of technical measures that are being researched as required.
From Activities to Outputs	
• Severe natural disasters occur during the project implementation period (such as heavy rain and forest fire). Implication: ⇒ Applicability of the techniques developed might become less.	• Prevention of risks: None. • Awareness raising: Forest management organizations (FE, WMB, etc.) continues its efforts on awareness raising concerning forest fire.

Note: Italic letters indicate the risk mitigation measures that are incorporated into the project design.

In the PDM, the risks are listed under the column 'Important Assumptions.' They are written in *positive terms*, because by definition Important Assumptions in the PDM are the *conditions required for the success of the project* but that exist outside of the project. While it is described in different phrases, the issues covered are the same as the risks presented above.

6.8 Preconditions and Prior Obligations

There are two important conditions that are required for successful project implementation. The first condition is the commitment of the GOV to maintain its investment to the reforestation program, which is mainly through the 661 Program, at least at the same level as present throughout the project implementation period. This is a critical condition, since the Project will be developing sets of technologies to be adopted by the 661 Program, leading to nation-wide application in the long term.

The second condition is the commitment of the GOV to maintain the investment of various programs aiming at improving local peoples' livelihoods, such as 747 Program and 135 Program, at least at the same level as present throughout the project implementation period. These national programs have significant impacts on the local people's livelihoods. As the economic condition of local people is likely to have a strong influence on the possibility and scale of application of the newly developed technologies in the field, continuation of these programs by GOV would be an important prerequisite.

7. Project Management and Coordination

7.1 Organizational Structure for Project Management and Implementation

The organizational structure is presented in Annex 4 of this document. The Project will have 3 operational units, namely Project Management Unit (PMU), Research Unit, and the On-Farm Trial Unit (OFTU). Each operational unit will consist of Vietnamese Project staff assigned from the core institution / organization, *and* JICA Expert(s). The operational units will be stationed in the 3 Project Offices listed below:

- Project Management Office: The Project Management Office, which will serve as the base for coordination activities, will be established in DFD (Hanoi). The PMU will be stationed in this office.

- Research Office: The Research Office, the base for the Research Unit and the center for research activities, will be established in FSIV (Hanoi).
- Provincial Office: The Provincial Office will be established in Sub-DFD Hoa Binh Province (Hoa Binh Town) to serve as the base for the OFTU.

The PMU will be the core unit responsible for overall project operation, including monitoring and evaluation of project activities. The DFD will be the main organization from the Vietnamese side. The Project Director, JICA Chief Advisor, and the Project Coordinator are the core members of the PMU, who will jointly perform the tasks to provide managerial and technical guidance to the Research Unit and OFTU, and in ensuring close coordination between these two units, as well as with other institutions, agencies, and departments involved in project implementation. The PMU will also perform the central role in consolidating and disseminating information to policy makers, donors, and local technical officers, and to a wider audience via web-publication.

The Research Unit, having FSIV as the core organization, will focus mainly on research, while the OFTU, with Sub-DFD serving the central role, will take the core responsibilities in conducting on-farm trial activities. Planning and implementation of activities by these 2 units *must always be closely linked, as explained in Section 7.2.* At the practical level, OFTU will involve a number of organizations, such as Song Da FE, Song Da WMB, AFE, and the nursery in Hoa Binh, as well as local farmers.

It is recommended that the Technical Task Force (TTC) is established, led by the Research Manager and the Chief Advisor. The TTC's main task will be to support the PMU in designing strategies and in planning activities, mainly in the fields of information compilation and dissemination, and in research. The TTC will also play a key role in examining the technical quality of project's publications, and in consolidating the project's recommendations to the 661 Program.

A Project Steering Committee (PSC) will be established as the body to supervise the PMU, and to provide overall direction on project implementation. The PSC, chaired by the Director General of DFD, will meet at least once every year in order to fulfill its functions. The committee meeting will also be convened at the time of mid-term and final evaluations, to provide necessary input to the evaluation mission and to review evaluation findings.

7.2 Linkage between the Research Component and On-farm Trial Component

As explained under *Section 4.2 – Problems to be Addressed*, weak linkage of forestry research and extension has been one of the important challenges faced within the forest sector. While institutional capacity building has not been highlighted as the core objective or outputs within the scope of the Project, effective linkage is considered to be an important factor for successful project implementation. As such, the Project aims at creating a working environment in which the research institute, state management bodies (including extension organizations), forest management organizations (i.e, FE and WMB), and local farmers can collaborate, so that it can present an example of practical collaboration and coordination at the field level. The Project should establish a system in which research results are communicated to the OFTU effectively, and likewise, the feedback from the field to the Research Unit. Technical officers from the Research Unit should participate in on-farm trial activities and provide practical technical guidance in the field.

8. *Ex-Ante* Assessment

8.1 Expected Impact

As explained under *Section 6.7 – Important Assumptions and Risk Analysis*, the Project has incorporated several activities in its design, to increase the probability of achieving the overall goal (i.e., application of newly developed technology by policy makers and end users). While the successful achievement of the overall goal depends highly on GOV's own efforts in mainstreaming the project results into national programs, the Project Purpose can be considered as a critical contribution nonetheless.

The socioeconomic impact expected from the Project, as assessed by the stakeholders of the Project, can be referred to in Annex 16. The main expected impacts are summarized in Table 8. It is worth noting that the positive impacts of the project include not only environmental aspects, but also socioeconomic aspects. Sub-DFD's assessment of the project's potential impact is high, including the acceleration of 661 Program implementation particularly in the areas of additional planting and natural regeneration, increase in the number of local people involved in forestry activities under national programs such as 661 and 747 Program, and in reducing upland farming (Annex 17).

In terms of direct technical transfer, the main target group will be the technical officers involved in extension activities in the 20 communes, which include 12 officers of the provincial AFE Center, 38 officers of district AFE Stations (4 districts and 1 town), 9 officers of Song Da FE, and 11 officers of Song Da WMB. In addition to the above, there will be commune extension workers and local farmers. The commune extension workers are stationed in 7 communes at present, and the GOV plans to assign extension workers in the other communes in the coming years.

Table 8 Summary of potential positive impacts of the Project

Policy Level	• Improvement in policies and mechanisms of 661 Program, accelerating the national effort on reforestation. • Improvement in policies on benefit sharing, government investment, and poverty alleviation, contributing to the betterment of people's livelihoods. • Feed in to national programs on poverty alleviation and job creation.
Nation-wide application (Outreach)	• Similar watershed areas like the Song Da Watershed. • Poor and degraded forests that need to be rehabilitated and properly used.
Local environment	• Soil erosion control, regulation of water source, and increase of forest cover.
Local people	• Improved awareness and knowledge on forest management. • Opportunities to express their needs, and to provide feedback to researchers and extension workers. • Improvement of economic conditions (additional sources of income), particularly for local people who have suffered from resettlement due to the construction of the dam.
Local technical officers and extension workers	• Improvement in knowledge and capacity on forest management. • Strengthened extension capability by means of manuals and other documents.

Source: Project Planning Workshop, 16 December 2002.

As for potential negative impact, stakeholders raised the following concerns. Firstly, the project may have impact on the availability of agricultural land. The Project is expected to implement activities mainly on unused bare land and/or on slope land not suitable for agriculture. While such land are normally not highly productive, and legally should be rehabilitated to become forestland, there may be situations in which the Project competes for land with upland farming. In such circumstances the area available for upland farming could be reduced, which would affect local people's livelihoods. To minimize this potential risk, the Project has incorporated support on farmland management in the activities under Output 2 (i.e., on-farm trial activities on soil conservation, agroforestry, etc., aiming at assisting local farmers to have stable cultivation land with higher productivity). The Project will also place high attention on the economic aspects of the technology to be developed, not only on the costs of introducing the technology, but also on the timing and scale of the benefits it may bring to the local farmers who participate in forest rehabilitation activities.

The second point of concern is the potential conflict or ill feelings between local farmers who directly participate in (hence benefit from) on-farm trial activities and those who will not be involved. As explained under *Section 6.5 – Outputs and Activities*, the Project should try to work with existing groups and organizations in the village, in the process of selecting the farmers. Close coordination with these organizations, consultation with local authorities such as commune people's committee and village chiefs, as well as the use of clear and transparent selection procedure, would reduce the risk of potential conflicts.

There is also a potential risk, considering the long-term nature of forestry research, that the duration of the project does not allow the research to achieve substantial output that can be applied in the field. The Project addresses this risk by combining *new research*, and the consolidation of *existing information*, both of which will be experimented and applied in the field. As pointed out by previous studies, research should be conducted in a field-oriented manner, putting more emphasis on adapted research offering benefits in the shorter term[18].

8.2 Relevance

The overall relevance of the Project is assessed to be high from the following 4 aspects: Relevance in terms of GOV's policy and priorities; national and local needs; JICA's policy and priorities; and the Project's relevance as an ODA funded project.

As explained in *Section 3.1 - Forest Sector in Vietnam*, increase of forest cover is one of the national development objectives set by the GOV. Under the 5MHRP, the government intends to reforest 1million ha through natural regeneration. In consideration of the national objectives, it can be said that the Project Purpose, which aims at developing sets of technology for natural forest rehabilitation is relevant. The Project's relevance can be justified further, in view of the constraints the GOV is currently facing on natural forest rehabilitation due to limited availability of technology. The Project will assist the GOV by submitting recommendations to improve the technical procedures of 661 Program. The Project's strategy also suits the needs of extension organizations and forest management practitioners, as the Project will support strengthening the link between forest research and extension through its operational mechanism. It will also contribute in building capacities of extension organizations and forest management practitioners through on-the-job training opportunities (refer *Section 4.2 – Problems to be Addressed*).

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[18] ADB, 2001. *Asian Development Bank TA – 3255. Draft Final Report: Study on the Policy and Institutional Framework for Forest Resources Management.*

The Project has been designed in close consultation with key stakeholders at central, provincial, district, and commune levels through series of workshops, group meetings, and interviews, as well as through village surveys. Hence, it can be said that the Project reflects the views and needs of the stakeholders to the extent practically possible. In particular, the Project design takes into consideration the local people's reliance on upland farming, and the importance of designing new technology in due consideration of economic aspects.

The Project is in line with JICA's Country Assistance Plan, under the priority area of the Environment, and within the Program area of afforestation technology improvement and forest establishment. The project's relevance is also supported by the recommendations from the forest sector analysis conducted by JICA Team in July 2002.

Finally, the Project can be assessed to be relevant for public investment, as a support to 'public goods.' The technology developed would mostly be utilized for rehabilitating natural forest that falls under the category of Protection Forest. While the forest managers, in some cases local households or individuals, may receive benefits from forest resources, the primary function of the Protection Forests is 'protection,' through which the benefits are shared by *population at large, including people residing in the downstream.* Furthermore, the newly developed technology can benefit a large number of people across the country in the future, when it is applied in the 661 Program.

8.3 Sustainability

Below summarizes the results from the Stakeholders' Workshop on sustainability issues (For details refer Annex 16).

Institutional capacity: The DFD has a keen interest in the development of technology on natural forest rehabilitation for the 661 Program. They are also interested in the costs and benefits of the technologies the Project would develop, which could provide insights on the economic norms of the 661 Program. In view of such high interest, the current institutional capacity, and its experience in working with other international organizations, it can be said that DFD has the motivation and basic capacity to act as the key institution to manage the overall project.

Experiences from past collaboration between JICA and FSIV have proven FSIV's strength as a research institute. Preparatory Study Team's assesses that FSIV has the basic capacity to implement the project efficiently, and to continue the research activities beyond the project duration. Through collaboration with JICA Experts, it is anticipated that institutional capacity will be further strengthened, especially in aspects of research design and managerial capability.

Institutional capacity of local institutions, especially the agriculture and forestry extension center, station, and commune extension workers, appeared to be limited, due to limited human and financial resources and the technical capability of extension workers particularly at the commune level. Capacities of WMB and FEs also appeared to be low. As the effective outreach of project benefits beyond the project duration highly depend on the capacity of these organizations, the Project and the GOV should place high efforts in strengthening these organizations, who act as extension agents and also as 'end-users' of the newly developed technology. The Project's framework that places high emphasis in on-farm trial activities is one of such efforts. It is expected that the capabilities of these organizations will be developed through on-the-job training opportunities under the on-farm trials.

Financial conditions: In view of the *Forest Development Strategy 2001 - 2010*, and the implementation plan of the 5MHRP, it is likely that the GOV's investment to the forest sector will be continued, particularly in the area of natural forest rehabilitation. Support to the watershed area of Hoa Binh Dam is also likely to remain as a high priority of the GOV. Hence, the GOV's investment level through the 661 Program should be maintained in the target area, allowing the project benefits to expand through the Program in the future years. On the other hand, financial conditions of extension organizations may be a potential constraint, on the extent to which the project benefits will be expanded beyond the 661 Program.

Technical adaptability: When the newly developed technology is integrated into the 661 Program, the technology will be disseminated by the technical officers of FE and WMB to the local people. The activeness of local farmers in adopting the technology will be highly dependent on the appropriateness of the techniques, the level initial investment and maintenance costs, and the expected economic return. It is critical for the Project to develop technology in due consideration of these aspects.

9. Reference Documents

ADB, 2001. *Asian Development Bank TA – 3255. Draft Final Report: Study on the Policy and Institutional Framework for Forest Resources Management.*

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10. Annexes

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Duration: 2003 - 2010 (8 years)

TARGET BENEFICIARIES:
Local farmers who participate in forest management (i.e. those who have been allocated or contracted forest land) Song Da FE, Song Da WMB, and AFE

DATE: 17 February 2003 (Minor changes on the version of 22 Dec. 2002)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Super Goal (Long Term Direction) Forest coverage is increased, and the environmental and economical values of forests are improved.			
Overall Goal Sets of technology for natural forest rehabilitation developed by the Project are applied by policy makers and by end users.	1 By 2009, recommendations submitted by the Project based on the research and on-farm trial findings are reviewed by MARD/DFD for application to the 661 Program. 2 By 2010, the area of forest rehabilitated in the 20 communes applying the techniques developed by the project has reached X ha. 3 By 2010, the number of farmers in the 20 communes who are applying the techniques developed by the project has reached X persons.	1 Reports of the Technical Committee of MARD/DFD. 2 Sub-DFD's annual report of the 661 Program. 3 Monitoring record of the Sub-DFD on the number of farmers applying the techniques developed by the Project.	• The review process of the new techniques developed by the Project and the administrative procedure to revise the technical procedure of 661 Program takes place in a timely manner. • There is no change in government's policies and strategies in terms of reforestation (i.e., promoting the use of indigenous species, and promoting the increase of forest cover by both plantation and by natural regeneration). • Vietnamese government's investment to reforestation is maintained beyond the duration of 661 Program (i.e., beyond 2010).
Project Purpose Sets of technically appropriate and economically affordable measures for natural forest rehabilitation are developed that can be used by forest enterprise, watershed management board, and extension workers.	1 By 2008 recommendations are submitted to 661 program based on the results from experiments and on-farm trials. 2 By 2008, a manual on hands-on techniques on the sets of natural forest rehabilitation techniques targeting local technical officers and farmers is prepared. 3 x technical officers of FE, WMB, and AFE learn new techniques through technical seminars.	1 Project Report of recommendations to MARD/DFD. 2 Publication of the manual on hands-on techniques. 3-1 Project record of seminar participants. 3-2 Seminar participant's feedback (evaluation sheet) on the applicability of new technology in their work.	• Sets of technologies developed by the Project is shared with forestry officers, extension workers, and community leaders in the 20 communes through the government's agriculture and forestry extension programs and/or through in-country training courses. • Economic conditions of the local people who participate in forest management do not fall below the current condition.
Outputs 1 Information on technology, results from other projects, manuals, and valuable experiences regarding natural regeneration, soil conservation measures , upland farming, forestry related policies, and people's participation in watershed area is compiled and systemized.	1 Web-based database is established by 2004 and is regularly updated. 2 By 2004, information on existing technology are compiled and made available in forms of Internet and publication. 3 Information on newly developed technology by the Project and by other organizations are regularly compiled by the Project throughout the project period.	1 & 3 Project record on database maintenance. 2 Project's publication list.	• Inflation rate remains at the level that do not affect the economic affordability of the technical measures developed by the project.
2 Techniques on silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field are developed through research and on-farm trials.	1 By 2007, at least one experimental site is established for each of the silvicultural measures stated under activity 2.4.2 – 2.4.9 in the PO, that have potential for field application. 2 By 2007, at least x on-farm trial plots are established involving y farmers in 5-6 communes. 3 By end of 2007, at least one silvicultural measure for natural forest rehabilitation is identified that can be applied for plantation, additional planting, and regeneration categories of the 661	1 Evaluation report of the experimental sites. 2 Monitoring records of the on-farm trial activities. 3 Technical evaluation report of the on-farm trial activities.	
3 Monitoring and evaluation system for the overall project implementation and for the respective research and trial activities are established and implemented.	1 Monitoring and evaluation system is effectively operating throughout the project implementation period.	1-1 Monitoring records of the Project. 1-2 Evaluation records of the Project. 1-3 Assessment on how the evaluation results have been reflected to the project activities' design and implementation.	
Activities 1.1 Collect and analyze written documents. 1.2 Conduct field visits to advanced projects and good examples. 1.3 Identify prominent species and methodology for the natural regeneration experiment and on-farm trials. 1.4 Publish leaflets on hands-on techniques targeting local farmers based on existing information and share with other projects. 1.5 Establish web-based database for collected information.	**Inputs** Vietnamese Government - Project Director - Project Coordinator - Research Manager - Research Coordinator - Provincial Manager - Provincial Coordinator - Technical Officers of FSIV Hanoi - Technical Officers of FSIV Hoa Binh - Technical Officers of DARD / Sub-DFD Hoa Binh - Technical Staff of Song Da FE - Technical Staff of Song Da WMB - AFE workers - Nursery workers - Facilities - Office space (DFD, FSIV, and Sub-DFD in Hoa Binh) - Space for installation and storage of equipment - Electricity, telephone line, water supply, etc. - Administration and Operational costs	Japanese Government - Long Term Experts (3) - Chief Advisor - Coordinator - Experts in the technical fields of: - Silvicultural Technique Development - Natural Forest Rehabilitation - Participatory Forest Management - Short Term Experts (No. to be decided) - Experimental Design Forest Soil Socioeconomic Survey Seedlings and Nursery Experiment Pest and Diseases Management Non-Timber Forest Products Agroforestry/Farming Systems Monitoring and Evaluation Other technical fields if necessary - Training of Vietnamese Personnel in Japan and/or third country - Machinery, Equipment, and Materials - Office equipment - Equipment for research - Equipment for nursery - Vehicles, Motor Boat, etc. - Establishment of experimental site and demonstration sites	• No severe natural disasters occur during the project implementation period (such as heavy rain and forest fire) that have sever impact on the research and trial activities.
2.1 Establish a demonstration site and on-farm trial activity sites to apply and verify currently available techniques. 2.2 Design research and on-farm trials on silvicultural measures for natural forest rehabilitation and farmland management. 2.3 Conduct and analyze research on native species seedling production. 2.4 Conduct and analyze research on silvicultural measures for natural forest rehabilitation. 2.5 Conduct and analyze on-farm trials on silvicultural measures for natural forest rehabilitation and farmland management. 2.6 Share the project results with relevant organizations.			
3.1 Based on Output 1 and baseline survey (activity 2.2.1), refine the Plan of Operations and the indicators for project purpose and outputs described in PDM. 3.2 Conduct monitoring and evaluation of the overall project implementation and on the experimental design and on-farm trial activities.			**Pre-conditions** • Vietnamese government's investment to the reforestation program is maintained at least at the same level as present. (i.e., 661 program) • Investment of various programs aiming at improving local peoples' livelihoods (e.g. 747 Program, 135 Program) is maintained at least at the same level as present.

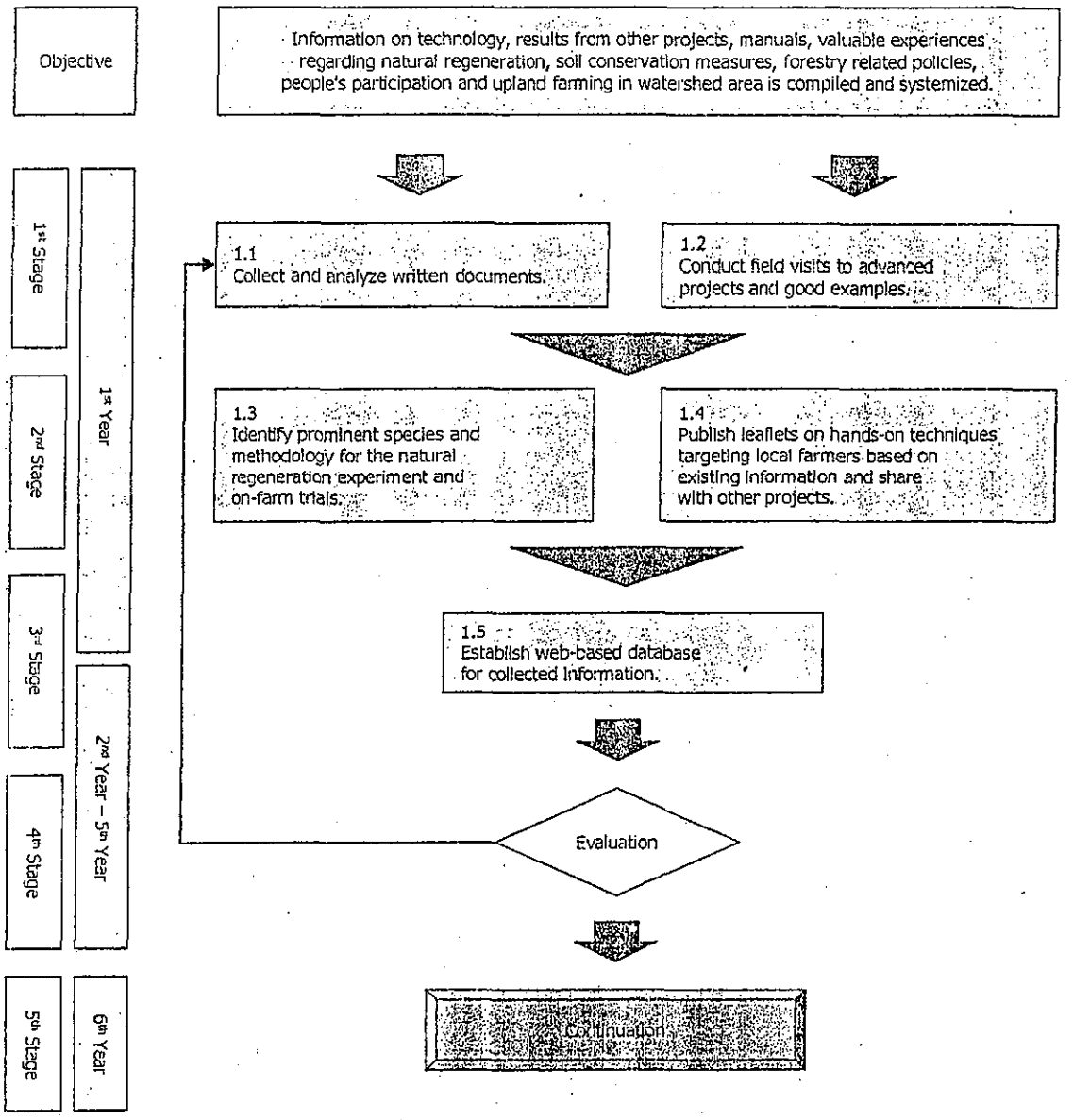
Abbreviations

FE: Forest Enterprise
WMB: Watershed Management Board
AFE: Agriculture and Forestry Extension System, which includes the following.
- Provincial Agriculture and Forestry Extension Center
- District Agriculture and Forestry Extension Stations
- Commune Extension Workers

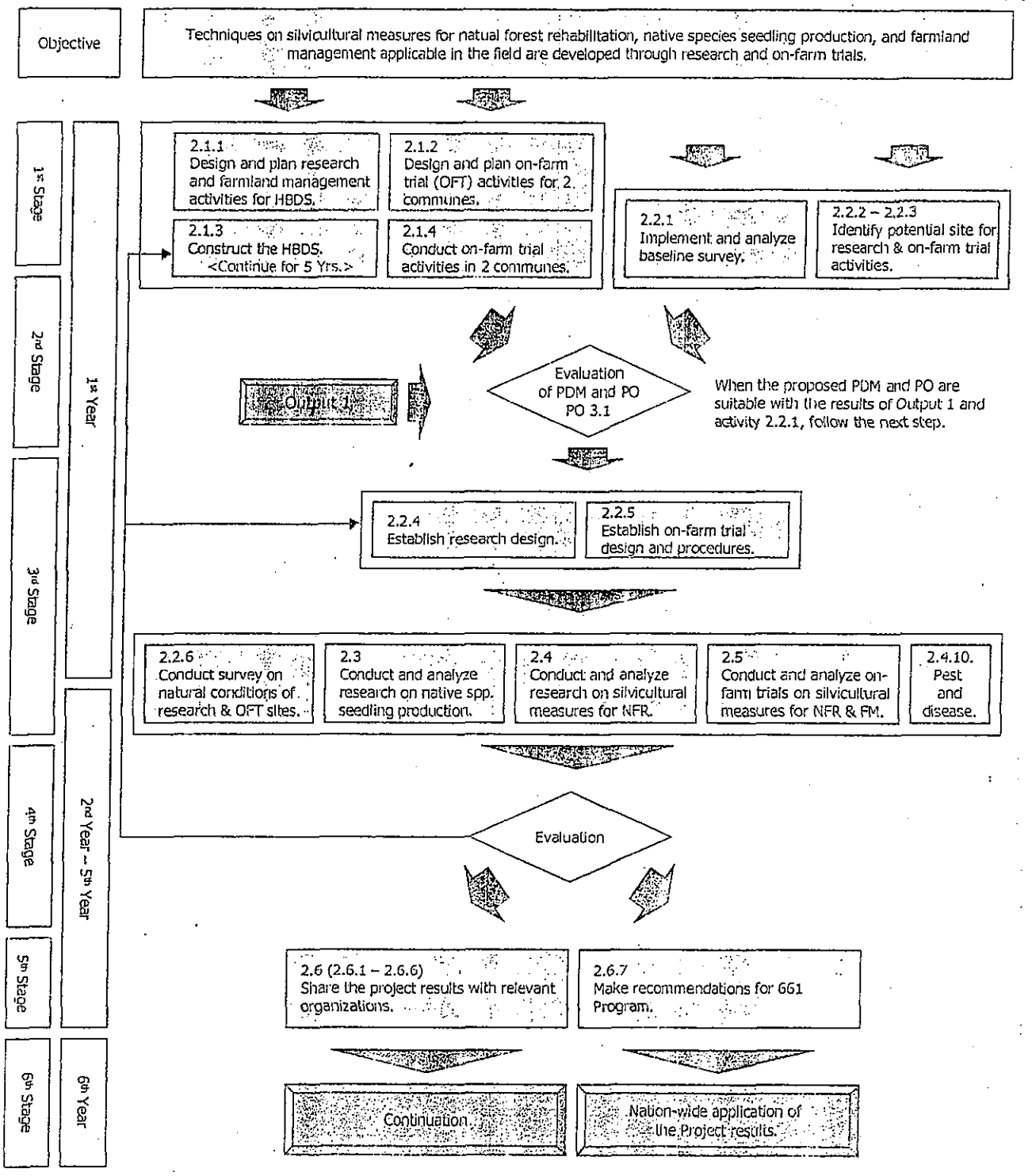
Annex 2: Plan of Operations (PO) and Flowcharts

2-1: Project Flowcharts

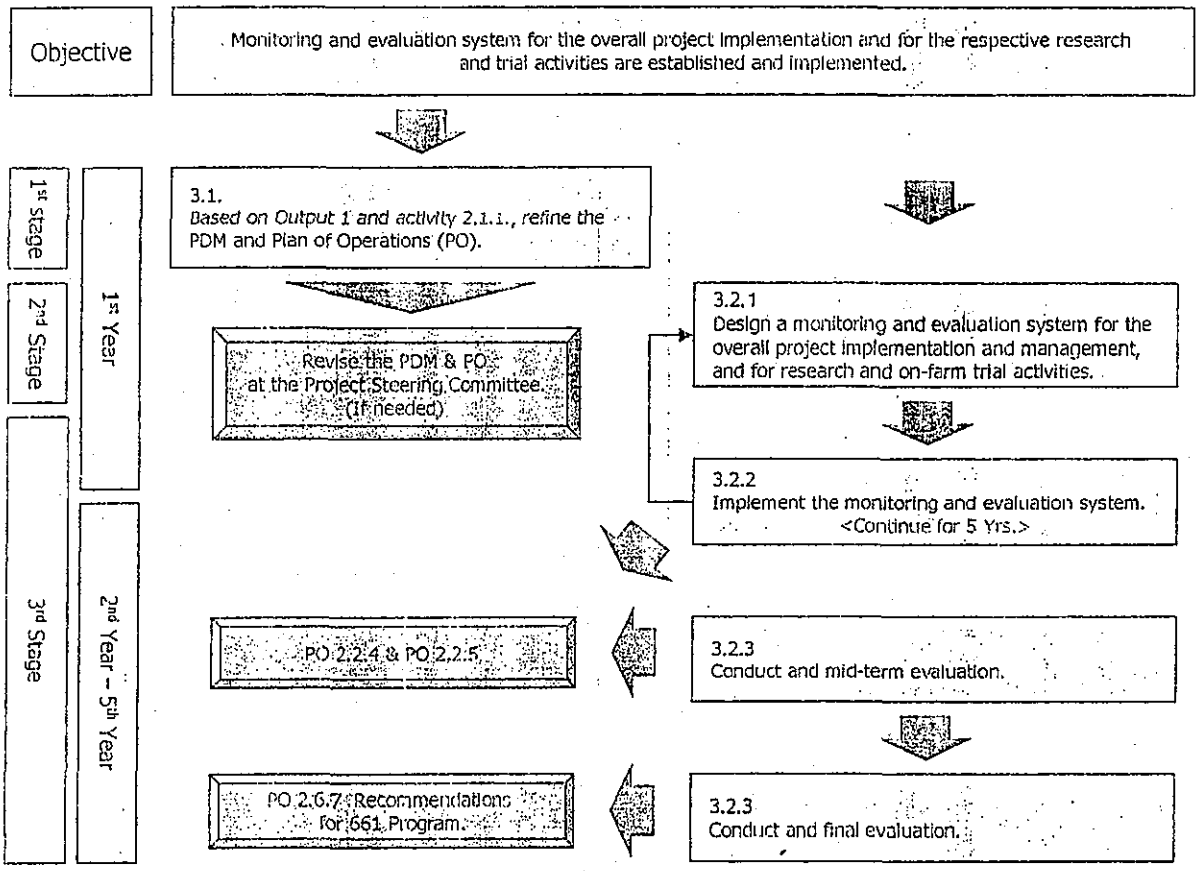
Project Flow Chart: Output 1



Project Flow Chart: Output 2



Project Flow Chart: Output 3



Annex 2: Plan of Operations (PO) and Flowchart

2-2: List of Corrections

Descriptions in the Annex of the Minutes of Meeting signed on 24/12/2002		Changes proposed in the Annex 2 of the Project Document	
PO No.	**Description**	**PO No.**	**Description**
2.1.2	FSIV *(for Responsible organizations)*	2.1.2	Sub-DFD
2.2.6	Conducts survey on natural condition of the potential experimental and on-farm trial sites.	2.2.6	Conducts survey on natural condition of the research and on-farm trial sites.
2.4.2	Conduct and analyze experimental for plantation of selected native spp. on bare-land	2.4.2	Conduct and analyze experimental for plantation of selected native tree spp. on bareland
2.4.3	Conduct and analyze direct sowing of tree species on bare lands.	2.4.3	Conduct and analyze direct sowing of tree species seeds on bare lands.
2.4.4	Conduct and analyze experiments for additional planting of selected native spp. in degraded forests.	2.4.4	Conduct and analyze experiments for additional planting of selected native tree spp. in degraded forests.
2.4.8	Conduct and analyze multi-strata methodology with newly introducing native spp. in currently established Accasia and Eucalyptus forests.	2.4.8	Conduct and analyze multi-strata methodology with newly introducing native tree spp. in currently established Acacia and Eucalyptus forests.
2.4.9	Conducts and analyze adequate thinning methodology for establishment of multi-strata forests.	2.4.8	Combine this PO Activity with PO 2.4.8
2.4.10	Conduct economic analysis for application of research results	2.4.9	(No change in the text)
2.4.11	Identify the cause of pest and disease and conducts experiment on the control.	2.4.10	(No change in the text)
2.5.2	Conduct and analyze plantation of selected native spp. on bare-land with local farmers	2.5.2	Conduct and analyze plantation of selected native tree spp. on bare-land with local farmers

Descriptions in the Annex of the Minutes of Meeting signed on 24/12/2002		Descriptions in the Annex of the Minutes of Meeting signed on 24/12/2002	
Changes proposed in the Annex 2 of the Project Document		Changes proposed in the Annex 2 of the Project Document	
2.5.4	Conduct and analyze additional planting of selected native spp. in degraded forests with local farmers.	2.5.4	Conduct and analyze additional planting of selected native tree spp. in degraded forests with local farmers.
2.6.4	Hold technical seminars to share the project results with local technical officers of FE, WMB, and AFE from 20 communes.	2.6.4	Hold technical seminars to give technical instructions to local technical officers of FE, WMB, and AFE from 20 communes. *(Activities indicated in dotted lines from the first year)*
2.6.5	Hold technical seminars to share the experimental results with relevant organizations and donors through technical seminars.	2.6.5	Hold technical seminars to share the Project results with relevant organizations and donors through technical seminars.
2.6.7	Make recommendations for 661 Program based on experimental results and on-farm trial results.	2.6.7	Make recommendations for 661 Program based on research and on-farm trial results.

Annex 2 – Plan of Operations and Flow Chart
Draft Plan of Operations (PO)

Outputs	Activities	Year 1		Year 2		Year 3		Year 4		Year 5		Responsible Organization(s)	0	50	100	Benchmark
		1	2	1	2	1	2	1	2	1	2					
1 Information on technology, results from other projects, manuals, valuable experiences regarding natural regeneration, soil conservation measures, forestry related policies, *people's participation* and upland farming in watershed area is compiled and systemized.	1.1 Collect and analyze written documents.											FSIV DFD Sub-DFD				25: On forestry related projects in Vietnam (documents and manuals) 50: On natural regeneration, native spp., soil conservation, upland farming, watershed mgt (National Level) 75: On Social, economics, policy, participation (National Level) 100: On advanced international researches
	1.2 Conduct field visits to advanced projects and good examples.											DFD FSIV Sub-DFD				25: *Planning (budgets, dates, arrangements with organizations)* 50: Field visits 60: Filing documents 75: Processing reports on each field trips 100: Completion of field trip reports
	1.3 Identify prominent species and methodology for the natural regeneration experiment and on-farm trials.											FSIV DFD Sub-DFD				25: Identification of prominent spp 50: Identification of seed sources or mother trees 75: Preliminary assessment on native spp adaptation for experimental use 100: Preliminary assessment on availability of native spp seeds
	1.4 Publish leaflets on hands-on techniques targeting local farmers based on existing information and share with other projects.											FSIV DFD Sub-DFD				25: On planting techniques 50: On nursery techniques 75: On tending techniques 100: Farm land management (for up-land agriculture)
	1.5 Establish web-based database for collected information.											FSIV DFD				25: Completion of designing platform for data base 50: Installation of equipments and software 75: Data inputs of collected information 100: Establishment of the self-sustain maintenance unit

Legends

- Activities that must take place at a given time.
- Sporadic activities.
- ..... Activities that will be continued over the *given time, but in low intensity.*
- Cumulative activities (activities that will increase the intensity over time)

Outputs		Activities		Year 1		Year 2		Year 3		Year 4		Year 5		Responsible Organization(s)	0 60 100	Benchmark
				1	2	1	2	1	2	1	2	1	2			
2	Techniques on silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field are developed through research and on-farm trials.	2.1	Establish a demonstration site and on-farm trial activity sites to apply and verify currently available techniques.													
		2.1.1	Design and plan research and farmland management activities for the Hoa Binh demonstration site based on currently available techniques.	*										FSIV Sub-DFD		50: Establishment of technical design for the Hoa Binh demonstration site on research activities and farmland management 75: Elaboration of plan (Budget, time, procedure, activity plan, etc.) 100: Approval of Management unit
		2.1.2	Design and plan on-farm trial activities in the selected two(2) communes based on currently available techniques and 661 program criteria.	*										Sub-DFD FSIV		25: Careful studies on 661 program 40: Establishment of technical design for on-farm activities in the selected two(2) communes 50: Elaboration of plan (Budget, time, procedure, activity plan, etc.) 60: Approval of the Provincial unit 100: Approval of the Management unit
		2.1.3	Construct the Hoa Binh demonstration site based on 2.1.1 and 2.1.2 (continue to 2.6.1 after the 1st yr.).											FSIV Sub-DFD		50: Construction of the Hoa Binh demonstration sites 100: Completion of report for the first round data
		2.1.4	Conduct on-farm trial activities in the selected two(2) communes based on 2.1.2 (continue to 2.5 after 1st yr.).											Sub-DFD FSIV		50: Initiation of on-farm trial activities in the selected two(2) communes 100: Completion of report on the first round data
		2.1.5	Analyze and evaluate the initial findings of activities 2.1.3. and 2.1.4, and feed them into activity 2.2.4 and 2.2.5.											FSIV Sub-DFD		100: Completion of analyze and evaluation to feed into activities 2.2.4 and 2.2.5.

* Jan-Mar is designing. From April they can plant.

Outputs		Activities		Year 1		Year 2		Year 3		Year 4		Year 5		Responsible Organization(s)	0 – 60 – 100	Benchmark
				1	2	1	2	1	2	1	2	1	2			
2	Techniques on silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field are developed through research and on-farm trials.	2.2	Design research and on-farm trials on silvicultural measures for natural forest rehabilitation and farmland management.													
			2.2.1 Implement and analyze baseline survey (Village profile and current situation of people in the watershed).											Sub-DFD FSIV		10: Completion of design for the baseline survey 20: Training of surveyors 30: Establishment of the data input interface 40: Implementation of the pre-survey 50: Adjustment of the interface 60: Completion of the baseline survey 75: Completion of analysis and compiling report 100: Identification of indicators for project evaluation
			2.2.2 Identify potential sites for research activities.											FSIV Sub-DFO		25: Establishment of criteria for potential research sites 50: Preliminary assessment of potential site selection for silvicultural technique development for natural forest rehabilitation research 100: Completion of site selection for all research activities
			2.2.3 Identify potential sites for on-farm trial activities.											Sub-DFO FSIV		25: Establishment of criteria for potential sites for on-farm trial activities 50: Preliminary assessment of potential site selection 100: Completion of site selection for on-farm trial activities
			2.2.4 Establish research design and procedures.											FSIV DFD Sub-DFD		25: Establishment of technical design for research activities 50: Elaboration of plan (Budget, time, procedure, activity plan, etc.) 75: Establishment of framework of economic analysis for research activities 100: Compilation of all technical designs, and publication on web
			2.2.5 Establish on-farm trial designs and procedures (including the establishment of criteria for selecting target farmers and level of inputs)											Sub-DFO FSIV		25: Establishment of technical design for on-farm trial activities 50: Elaboration of plan (Budget, time, procedure, activity plan, etc.) 75: Establishment of framework on economic analysis for on-farm trial activities 100: Compilation of all technical designs, and publication on web
			2.2.6 Conduct survey on natural conditions of the research and on-farm trial sites.											FSIV		25: Completion of designing for site survey 50: Completion of site survey 75: Completion of report on site survey 100: Completion of manual on site survey
2	Techniques on silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field are developed through research and on-farm trials.	2.3	Conduct and analyze research on native species seedling production.											FSIV Center of Breeding Plant in Hoa Binh Province		10: Identification of research needs on native spp. seeding production 20: Establishment designs for native spp. seedling production experiment 30: Acquisition of native spp. seeds 40: First round experiments 50: Analysis on the first round experiments and revision of the experimental design 60: Second round experiments (if not successful, continue) 70: Analysis on the second round experiments and revision of the experimental design 80: Establishment of methods on native spp. seedling production 100: Completion of manual and reports on the experimental results

Outputs		Activities		Year 1		Year 2		Year 3		Year 4		Year 5		Responsible Organization(s)	0 50 100	Benchmark
				1	2	1	2	1	2	1	2	1	2			
2	Techniques on silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field are developed through research and on-farm trials.	2.4	Conduct and analyze research on silvicultural measures for natural forest rehabilitation.													
		2.4.1	Establish control plots to examine and analyze natural regeneration.	Establishment	Continue Data Collection and Analysis									FSIV		25: Identification of control plot sites 50: Establishment of the control plots 75: Analysis of vegetation of the control plots 100: Completion of data on the control plots
		2.4.2	Conduct and analyze experiments for *plantation of selected native tree spp. on* bare-lands	Establishment	Continue Data Collection and Analysis									FSIV		25: Establishment of plots and implementation of experiments 50: Analysis of the first round data and completion of the mid-term report 75: Completion analysis of the experiments 100: Completion of reports and manuals
		2.4.3	Conduct and analyze direct sowing of tree species seeds on bare lands.	Establishment	Continue Data Collection and Analysis									FSIV		
		2.4.4	Conduct and analyze experiments for additional planting of selected native tree spp. in degraded forests.	Establishment	Continue Data Collection and Analysis									FSIV		
		2.4.5	Conduct and analyze experiments for assisting (accelerating) establishment of valuable regenerated native tree spp.	Establishment	Continue Data Collection and Analysis									FSIV		
		2.4.6	Conduct and analyze experiments on the combination of bamboo and other trees or non-timber spp.	Establishment	Continue Data Collection and Analysis									FSIV *Sub-DFO*		
		2.4.7	Conduct and analyze the introduction of non-timber spp. in both degraded and established forests.	Establishment	Continue Data Collection and Analysis									FSIV		
		2.4.8	Conduct and analyze multi-strata methodology with newly introducing native tree spp. in currently established Acacia and Eucalyptus forests.	Establishment	Continue Data Collection and Analysis									FSIV Sub-DFO		
		2.4.9	Conduct economic analysis for application of research results.	□								□		FSIV Sub-DFO		20: Establishment of economic analysis design for on-farm trials 40: Conduct of economic analysis for on-farm trials (year 1) *60: Conduct of economic analysis for on-farm* trials (year 5) 80: Evaluation of economic analysis 100: Completion of the report
		2.4.10	Identify the cause of pest and disease and conduct experiment on the control.											FSIV		10: Identification of pest and disease 25: Preliminary evaluation on future experiment 50: Establishment of experimental designs and plans 60: Implementation of experiments 75: Completion of analysis of the experiments 100: Completion of reports and manuals

Outputs		Activities		Year 1		Year 2		Year 3		Year 4		Year 5		Responsible Organization(s)	0 50 100	Benchmark
				1	2	1	2	1	2	1	2	1	2			
2	Techniques on silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field are developed through research and on-farm trials.	2.5	Conduct and analyze on-farm trials on silvicultural measures for natural forest rehabilitation and farmland management.													
		2.5.1	Identify farmers for on-farm trial on natural regeneration and on farmland management.			▨	▨	▨						Sub-DFD FSIV		10: Coordination with People's Committee, WMB, FE, and related authority 20: Identification of farmers with People's Committee, WMB, FE, and related authorities 30: Establishment of contracts with farmers 50: Establishment of plots and implementation of *on-farm trials* 60: Analysis of the first round data and compilation of mid-term report 75: Completion analysis of the on-farm trials 90: Compilation of reports and manuals 100: Submission of reports to People's Committee, WMB, FE, and related authorities
		2.5.2	Conduct and analyze plantation of selected native tree spp. on bare-land with local farmers.				▨	▨	▨	▨	▨			Sub-DFD FSIV		
		2.5.3	Conduct and analyze direct sowing of tree species on bare land.				▨	▨	▨	▨	▨			Sub-DFD FSIV		
		2.5.4	Conduct and analyze additional planting of selected native tree spp. in degraded forests with local farmers.				▨	▨	▨	▨	▨			Sub-DFD FSIV		
		2.5.5	Conduct and analyze experiment for assisting (accelerating) establishment of valuable regenerated native tree spp.				▨	▨	▨	▨	▨			Sub-DFD FSIV		
		2.5.6	Conduct and analyze on-farm trials of the combination of bamboo and other trees or non-timber spp.				▨	▨	▨	▨	▨			Sub-DFD FSIV		
		2.5.7	Conduct and analyze the introduction of non-timber spp. in both degraded and established forests.				▨	▨	▨	▨	▨			Sub-DFD FSIV		
		2.5.8	Conduct and analyze on-farm trials on farmland management.				▨	▨	▨	▨	▨			Sub-DFD FSIV		
		2.5.9	Conduct and analyze small scale seedling production.				▨	▨	▨	▨	▨			Sub-DFD Center of Breeding Plant in Hoa Binh FSIV		10: Establishment of designs for small scale seedling production 20: Creation of a hands-on manual for small scale seedling production 30: Establishment of criteria for in-put level for small scale seedling production 40: Village meetings on small scale seedling production 50: One day seminar on small scale seedling production 60: Installation of small scale seedling production 70: Analysis and revision on designs, manuals, and criteria 100: Completion of manuals and reports of the results
		2.5.10	Conduct economic analysis for application of on-farm trial results.	☐								☐		FSIV DFD Sub-DFD		20: Establishment of economic analysis design for on-farm trials 40: Conduct of economic analysis for on-farm trials (year 1) 60: Conduct of economic analysis for on-farm trials (year 5) 80: Evaluation of economic analysis 100: Completion of the report

Outputs		Activities		Year 1		Year 2		Year 3		Year 4		Year 5		Responsible Organization(s)	0	50	100	Benchmark
				1	2	1	2	1	2	1	2	1	2					
2	Techniques on silvicultural measures for natural forest rehabilitation, native species seedling production, and farmland management applicable in the field are developed through research and on-farm trials.	2.5	Share the project results with relevant organizations.															
		2.6.1	Reflect the research results and on-farm trial findings on to the Hoa Binh Demonstration site (refer activity 2.1.3).											FSIV Sub-DFD				25: Production of a field guide leaflet of the Hoa Binh Demonstration site 75: Establishment of the Hoa Binh Demonstration site 100: Completion of reports on the Hoa Binh Demonstration site
		2.6.2	Publish the experimental results.											FSIV DFD Sub-DFD				25: Completion of analysis of the researches 50: Establishment of editing committee 75: Publication of project results in both prints and web 100: Publication of Manuals in both prints and web
		2.6.3	Publish manuals on hands-on techniques based on on-farm trial results, targeting technical officers and farmers.											FSIV Sub-DFD DFD				50: Establishment of editing committee 100: Publication of manuals in both prints and web
		2.6.4	Hold technical seminars to give technical instructions for the local technical officers of FE, WMB, and AFE from the 20 communes.											Sub-DFD FSIV				25: Organization of technical seminars 50: Implementation of seminars 100: Publication of proceedings of the seminars
		2.6.5	Hold technical seminars to share the Project results with relevant organizations and donors through technical seminars.											DFD FSIV				25: Organization of technical seminars 50: Implementation of seminars 100: Publication of proceedings of the seminars
		2.6.6	Hold seminars and conduct field visits for local farmers from 20 communes to study successful on-farm trial results.											Sub-DFD FSIV				25: Organization of field visits and seminars 50: Implementation of field visits and seminars 75: Follow-up evaluation for the participants (To evaluate effectiveness of field visits and seminars) 100: Completion of analysis of the follow-up evaluation
		2.6.7	Make recommendations for 661 program based on research and on-farm trial results.											DFD FSIV Sub-DFD				50: Completion of analysis of the research and on-farm trial for making recommendation for 661 program 100: Submissions of recommendations

Outputs	Activities	Year 1		Year 2		Year 3		Year 4		Year 5		Responsible Organization(s)	0	50	100	Benchmark
		1	2	1	2	1	2	1	2	1	2					
3 Monitoring and evaluation system for the overall project implementation and for the respective research and trial activities are established and implemented.	3.1 *Based on Output 1 and baseline survey (activity 2.2.1),* refine the Plan of Operation and the indicators for project purpose and outputs described in PDM.	□										DFD FSIV *Sub-DFD*				25: Assessment of the PO 50: Assessment of indicators for project purpose and outputs described in PDM (If there is no need to change them, complete this activity: 100) <If necessary> 75: Preparation of recommendations for refining Indicators and PO to the Project Steering Committee 100: Approval of GOV and GOJ on the refinement
	3.2 Design and conduct monitoring and evaluation systems for the overall project implementation and management, and for research and on-farm trial activities.															
	3.2.1 Design a monitoring and evaluation system for the overall project implementation and management, and for research and on-farm trial activities.	□										DFD FSIV Sub-DFD				20: Establishment of Monitoring and Evaluation System and Manual for overall project implementation and management 40: Establishment of Monitoring and Evaluation System and Manual for research and on-farm trial activities 60: Approval of the M&E System by the Project Steering Committee 100: Training on the operation of M&E system for project staff
	3.2.2 Implement the monitoring and evaluation system.			———	———	———	———	———	———	———	———	DFD FSIV Sub-DFD				30: Implementation of M&E system by project staff 60: Annual evaluation of project progress by the Project Steering Committee 100: Improvement of experimental design and on-farm trial methodologies based on M&E results
	3.2.3 Conduct mid-term evaluation (and refine the Plan of Operations if necessary) and final evaluation.					□				□		DFD FSIV Sub-DFD				20: Mid-term evaluation 40: Assessment of progress of the project. 80: Improve the Plan of Operations (if necessary) 100: Final evalutation