4. Crops: Research, Extension and Related Activities

Project No. AC-1

1. Title of Project/Program

   Rice Seed Multiplication Improvement Project

2. Location

   Nationwide

3. Objectives

   To increase the unit yield of rice production through increase of certified rice seed production and expansion of use of improved rice seeds at farmer level.

4. Project/Program Description

   At present, the annual production of improved rice seeds through public seed multiplication system is summarized as follows:

Name of Center	Location	Annual Production of Improved Rice Seeds (ton)
1. Napok Seed Multiplication Center	Vientiane Municipality	110
2. Thasano Rice Research and Seed Multiplication Center	Savannakhet Province	110
3. Phone Ngam Rice Research and Seed Multiplication Center	Champasak Province	90
4. Pakchaeng Research Station	Vientiane Province	40
5. KM 6	Vientiane Municipality	50
6. Agriculture Extension Agency (AEA)	Vientiane Municipality	40
7. Saravan	Saravan Province	50
Total		490

Source: Napok Seed Multiplication Center

According to available data of MAF, 60-70% of rice farms use improved variety seeds in the wet season, while 100 % of rice farms use improved variety seeds in the dry season. Research conducted by Lao-IRRI indicates that there is a 10-15% increase in yield with use of improved seed alone. The above table shows that the annual supply of improved seed varieties is about 490 tons through public seed multiplication system. This amount will only cultivate about 7,000 ha with a sowing rate of 70 kg/ha equivalent. If it is necessary to renew the seed stock every five years, a continuous annual supply of 490 tons can only cover 35,000 ha, or about 6% of the lowland paddy area including both wet and dry season cultivated area. It is therefore judged that most farmers use the improved seed for a long period without renewal, though Lao-IRRI project recommends renewal of seeds every three years. In addition, the following constraints are observed in the present seed multiplication system.

(1) Due to lack of extension system, farmers cannot understand the production effect of improved seeds. In this situation, farmers are reluctant to pay a high price for improved seeds. In addition, farmers who live in remote areas pay

higher transportation cost of seeds.

(2) The present production of seed multiplication centers is much lower than designed capacity due to shortage of operation budget, risk of oversupply against farmers demand, incomplete seed processing facilities, and low technical level of staff. Risk of oversupply appears to be the largest problem in the seed multiplication system.

(3) It is pointed out that the quality of rice seeds is not so high and its germination rate is around 85% due to insufficient quality control and incomplete processing facilities. This low quality may be one of the reasons that farmers show little interest in use of improved seeds.

(4) All the seed multiplication centers are located in the central or southern region. There is no public seed multiplication system in northern region. To settle this problem, rice research center/station located in Xaignabouri and Oudomxai provinces produce rice seeds using foundation seeds produced by Napok Seed Multiplication Center. However, the provincial centers have no seed processing facilities.

In addition, preliminary projection on paddy/rice food balance is made for the year 2010 and 2020 based on official data from the relevant agencies and assumptions. The projection is shown below.

Table Paddy Balance Projection

Unit : 000 ton paddy

	Year 2000	Year 2010	Year 2020
Production	2,202	2,793	3,032
Consumption **(*1)**	1,846	2,345	2,894
Balance	356	448	138

(*1): including seed, processing loss and other use requirements

Above table shows further yield improvement is required form the viewpoints of food security. The improved rice seed can contribute the yield improvement with relatively low cost.

The proposed project will address all the above constraints through confirmation of farmers needs, rehabilitation of existing facilities, technical upgrading, restructure of seed distribution system in cooperation with extension system. In addition, the contract farmers system for production of registered seeds should be expanded, since intervention of public sector and public investment should be minimized.

The project will cover in the whole country, thus step-wised development is required. Proposed phase of the project will be as follows:

Phase I: Technical assistance on future seed multiplication plan and rehabilitation plan, rehabilitation of Napok Seed Multiplication Center and Thasano Rice Research and Seed Multiplication Center as well as technical cooperation in those centers including implementation of

training program.

Phase II: Rehabilitation of other Seed Multiplication Centers and upgrading of rice research stations as well as implementation of technical training program.

Phase III: Construction of new seed multiplication centers, if required.

5. Project Components

(1) Technical assistance on future seed multiplication plan, rehabilitation and upgrading plan, design, cost estimation as well as preparation of tender document.

(2) Rehabilitation of existing seed multiplication facilities, upgrading of research stations for seed multiplication.

(3) Technical assistance for staff training including on the job training and overseas training as well as training to contract farmers in the seed multiplication center and farmers field.

(4) Technical assistance for setting up of registered/certified seed multiplication made by growers.

(5) Construction of new seed multiplication center, if required.

6. Project Costs

Phase I: US$ 5,613 thousand

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	1,000	3,285	285	285	285	5,140
Recurrent Cost	40	176	86	86	86	473
Total	1,040	3,461	371	371	371	5,613

Phase II: US$ 8,817 thousand

Cost Item	1st Year	2nd Year	3rd Year	Total
Capital Cost	1,380	6,480	480	8,340
Recurrent Cost	124	267	87	477
Total	1,504	6,747	567	8,817

Phase III: US$ 7,941 thousand

Cost Item	1st Year	2nd Year	3rd Year	Total
Capital Cost	1,230	5,930	330	7,490
Recurrent Cost	119	250	82	451
Total	1,349	6,180	412	7,941

Total for Rice Seed Multiplication Project: US$ 22,371 thousand

7. Implementing Agency

The Department of Agriculture (DOA), Ministry of Agriculture and Forestry

8. Organizational and Staffing Requirements

This program will be implemented under the existing seed multiplication centers and additional staff will not be required.

	Key Counterpart
1. Phase I	10
2. Phase II	25
3. Phase III	25
Total	60

9. Implementation Schedule

The project will be implemented as follows:

(1) Phase I: 5 Years

First Year	Planning & Design
Second Year	Rehabilitation & Technical Assistance
Third to Fifth Year	Technical Assistance & Training

(2) Phase II: 3 Years

First Year	Planning & Design, Technical Assistance & Training
Second Year	Rehabilitation & Technical Assistance & Training
Third Year	Technical Assistance & Training

(3) Phase III: 3 Years

First Year	Planning & Design, Technical Assistance & Training
Second Year	Rehabilitation & Technical Assistance & Training
Third Year	Technical Assistance & Training

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed that the existing seed multiplication center can not maintain existing processing facilities properly due to a lack of operation & maintenance (O&M) budget. Therefore, a revolving fund will be established using income from selling improved rice seeds and the entire O&M costs and staff allowances should be met from this fund.

11. Expected Benefit

(1) Qualified improved seed of rice will be applied in almost 100% of both rainfed and irrigated paddy field

(2) Rice productivity will be enhanced through using qualified improved seed.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counter budget for operation and maintenance cost of seed multiplication centers.

(2) Trained staff leaving the seed multiplication center for new assignments or new jobs.

(3) Extension system does not function well to provide farmers with information on effect of improved rice seeds.

(4) The road system to remote area is not established to distribute improved rice

seeds.

13. Assessment of Natural and Social Environment

    (1) Natural environment: Small negative impacts are expected in the rehabilitation or new construction of seed multiplication facilities.

    (2) Social environment: No impacts are expected.

14. Special Arrangements

    In the initial stage for the project, subsidy to seeds might be required for expansion of improved seed use of farmers.

Project No. AC-3

1. Title of Project/Program

   Integrated Upland Agricultural Research Project (IUARP)

   This is an ongoing project. Continuation of the project is proposed, in the light of its importance.

2. Location

   Northern Region Agriculture and Forestry Research Center (NRAFRC) and selected village cluster in Louangphrabang province

3. Objectives

   (1) To develop, test and refine the methodology for integrated upland agricultural research,

   (2) To develop sustainable livelihood systems as alternatives to slash and burn,

   (3) To upgrade current staff capacity in integrated upland agricultural research within NAFRI, PAFO and DAFO,

   (4) To enhance community development, decision making and leadership capacity within the target communities.

4. Project/Program Description

   Research activities are generally sluggish in Lao PDR, except for Lao-IRRI Rice Research and Training Project (LIRRTP) which has been the principal source of technological developments and capacity building in the rice sector since 1990. LIRRTP has showed a worthy accomplishment of the research works particularly in lowland rice production in the past ten-year operation. On the other hand, the research programs for crop diversification in the lowland environment and for integrated upland agricultural development in the upland environment are still important subjects in Lao PDR.

   This proposed project was formulated primarily for the stabilization of shifting cultivation through the development of integrated agriculture in the upland environment. In general in the upland environment, population pressure is increasing, alternative land use is lacking, land availability is limited, and fertility decline and cumulative soil erosion combine to make the farming systems unsustainable. Currently farmers in much of the uplands are unable to produce sufficient rice to feed their families.

   Recognizing the above nature in the upland environment, IUARP is now implemented giving a priority to the following fields:

   (1) Rice Based Cropping Systems; rice variety improvement, vegetative contours, weed management, nutrient management, rodent control and fallow management,

(2) Crop Diversification; perennial crops (fruit and agro-forestry), forestry, annual crops,

(3) Livestock; forage evaluation, husbandry and management.

IUARP is now under implementation with financial and technical assistance from many donors including Lao-IRRI (SDC), IRS (International Research Scientist), ICRAF (International Center for Research in Agroforestory) and others.

In the light of the importance of IUARP, the continuation of the project is proposed at least for the next 10 years until 2011. Through the continuous operation of the project, valuable research outputs for the stabilization of shifting cultivation are expected to be produced.

5. Project Components

The project components will principally be as follows:

(1) Technical assistance for research programming,

(2) Training of the project staff and PAFS/DAFO staff,

(3) General and direct operating expenses, and

(4) IUARP operation equipment including computers and motorcycles.

6. Project Costs

About US$ 1.8 million for ten years of the project implementation as follows:

(Unit: Thousand US$)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Total
Capital cost	0	285	285	285	285	1,380	6,480	480	1,230	5,930	330	16,970
Recurrent Cost	62	70	70	70	70	124	267	87	119	250	82	1,271
Total	62	355	355	355	355	1,504	6,747	567	1,349	6,180	412	18,241

7. Implementing Agency

Northern Region Agriculture and Forestry Research Center (NRAFRC) of NAFRI, MAF

NRAFRC is located in Louangphrabang province.

8. Organizational and Staffing Requirements

The organizational plan stated in the project document of IUARP is as follows:

(1) IUARP Steering Committee; This was established within NAFRI and chaired by Director of NAFRI. The committee members are the IUARP Project Leader, relevant national line agencies and representatives from each of the major participating international agencies (e.g. SDC, IRRI, FLSP, PPI, ICRAF, IBSRAM, and ACIAR).

(2) Technical Advisory Group; This was organized in order to provide technical assistance to IUARP.

(3) NRAFRC of NAFRI is functioning as the project office where the project leader and other project staff are stationed.

To date, three staff have been assigned in NRAFRC. They are project leader, site coordinator, and project technician. In addition to them, several PAFS and DAFO staff are available for the filed research activities. For the effective and efficient operation of the project, it is proposed to increase the number of staff, at least by more than two researchers in order to conduct the research on livestock and fruits trees an the integrated manner.

9. Implementation Schedule

IUARP is the ongoing project. It practically commenced in 1999 after the selection of research target area. Although the project implementation schedule is not clear in the IUARP's program, it is proposed to continue the project at least for the next ten years until 2006.

10. Lessons Learnt and How Incorporated into Proposed Project

The policy recognized that the local communities are the essential managers of the upland system. Because of this, research concept of the proposed project adopted the bottom-up participatory approach.

11. Expected Benefit

(1) Stabilized slash and burn cultivation,

(2) Improved food security,

(3) Reduced erosion and other environmental hazards,

(4) Increased income of farm households.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Weak coordination among the agencies concerned including donor agencies would lower the project efficiency.

(2) Weak leadership of NAFRI/IUARP would prevent the project progress and bring less research outputs.

13. Assessment of Natural and Social Environment

(1) Natural environment: Positive impacts through improved soil and water conservation, reduced community dependence on forest resources,

(2) Social environment: Positive impacts through reduction of poverty and increased community self-reliance.

14. Special Arrangements

Nil.

Project No. AC-4

1. Title of Project/Program

   Crop Diversification Program

2. Location

   Irrigation Area in Mekong Corridor of Borikhamxai, Khammouan, Savannakhet, Saravan, and Champasak Provinces (Districts under Group3 & 4)

3. Objectives

   To enhance farm income through expansion of crop diversification for second crop season in irrigation area

4. Project/Program Description

   In the plains areas of Borikhamxai, Khammouan, Savannakhet, Saravan, and Champasak Provinces (major part of Mekong Corridor in Lao PDR), irrigation systems are developed and used mainly for paddy production in both wet and dry season. The recent five years of harvest area of dry season paddy in the above provinces is summarized below:

Table Harvest Area of Dry Season Paddy during 1996-2000

(Unit: ha)

	Borikhamxai	Khammouan	Savannakhet	Saravan	Champasak	Total
1996	80	972	2,460	290	560	4,362
1997	444	1,880	4,363	1,185	2,218	10,090
1998	3,428	3,916	11,444	3,684	8,410	30,882
1999	6,050	6,720	20,155	5,820	16,700	55,445
2000	4,307	7,773	21,250	4,890	19,230	57,450
Average	2,862	4,252	11,934	3,174	9,424	31,646

Source: Agriculture Statistics, 2000, DOP, MAF

The above five provinces occupy 56% of total dry season paddy in Lao PDR (56,000 ha). The above table shows that dry season paddy has expanded at around 90% p.a. during period of 1996-2000, because irrigation pumps have been installed under National Pump Irrigation and Management Project (NPIMP). Therefore, most of the irrigation area developed under the NPIMP is supposed to be used as paddy field.

According to the assessment result on agriculture setting by districts, the Group 3 & 4 are major groups in the project area. Those groups are characterized into the following in terms of cropping system; i) the cropping system is diversified to some extent in Group 3, and ii) mono-culture-type paddy production is dominant in Group 4.

In this context, most farmers show a higher concern for food security rather than the introduction of new crops in the project area. As a practical matter, new generation farmers who require the land for their food production would expand the paddy land. Moreover, the farmers have limited experience on cultivation of

crops other than paddy and are accordingly risk averse. In such cases, over production of rice would possibly occur. In order to avoid such a situation as well as enhance farm income, crop diversification should be promoted particularly in the second crop of irrigation area.

The proposed project will expand crop diversification in the irrigation area through extension service including preparation of crop management calendars, and demonstration plots and associated farmer training. The project will be carried out mainly by DAFO staff in the districts concerned with the full technical and administrative support of PAFS and DOA. The training program of DAFO and PAFS staff is important component of the project. The staff training will be made in the form of on-job training, and study tour in other countries.

In the project, crop management calendar will be prepared and the calendar would include necessary operations in the field from land preparation to post harvest management. The calendar would fit in with farmers capability and existing agricultural conditions. Moreover, the calendar will be modified from time to time on the basis of field demonstration result. Small and manageable demonstration plots using trial species and/or adaptive technology on crop diversification will be established under the full management or guidance of extension staff of DAFO. The demonstration plot would be located in the place where farmers pass frequently and trial species and/or adaptive technology developed by NAFRI or in other neighboring countries will be applied. The farmers could then experience the technical possibilities and financial attractiveness of diversification. For propagation of demonstration plots, training for local extension staff and farmers will be implemented on the basis of "Teach by Showing".

Expected technical inputs are: i) overall project management (training and extension), ii) agronomist (vegetable), iii) agronomist (upland crop) iv) water management, v) post harvest and marketing, vi) agro-economist.

In the fifth year of the program, the progress and project impact will be reviewed and the program design will be modified, if necessary. The government will continue the program using its own budget on the basis of recommendation made by review study. The program is expected to continue until the 10^{th} year at least.

5. Project Components

(1) Technical assistance for overall project management, preparation of crop management calendar, selection, design and establishment of demonstration plots.

(2) Implementation of training program for DOA, PAFS and DAFO staff.

(3) Operation and maintenance of demonstration plots by DAFO staff.

(4) Implementation of technical guidance to farmers in the demonstration plots.

(5) Technical assistance for establishment of community management nursery

preparation.

(6) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&E) survey.

6. Project Costs

Total project cost is US$ 4,533 thousand consists of US$ 3,506 thousand for phase I and US$ 1,027 thousand for phase II (local fund only). The detailed is shown below:

Phase I (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	880	790	382	279	264	2,595
Recurrent Cost	118	209	197	194	193	911
Total	998	999	579	473	457	3,506

Phase II (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	20	20	20	20	0	80
Recurrent Cost	189	189	189	189	189	947
Total	209	209	209	209	189	1,027

7. Implementing Agency

(1) Department of Agriculture (DOA), Ministry of Agriculture and Forestry

(2) Provincial Agriculture and Forestry Services (PAFSs) in Borikhamxai, Khammouan, Savannakhet, Saravan, and Champasak Provinces

(3) District Agriculture and Forestry Offices (DAFOs), to be named in the initial stage of the project

8. Organizational and Staffing Requirements

The required number of staff is 118 in total and additional staff will not be required. The details are shown below:

	Required Stuff
1. DOA	3
2. Staff in Province	15
3. DAFO Project Staff	100
Total	118

9. Implementation Schedule

The program will be implemented in 10 years, consisting of 5 years for donor-assisted phase I and 5 years for phase II (local fund only) according to the following schedule.

Phase I: Donor assisted (1st-5th year)

(1) 1st Year: Preparatory period for planning, implementation of agricultural needs assessment and baseline survey, preparation of draft crop management calendar,

implementation of training program to staff

(2) 2nd Year — Establishment of demonstration plots (20 plots), implementation of training program to staff and farmers

(3) 3rd - 4th year: — Establishment of demonstration plots (40 plots x 2 years = 80 plots), implementation of training program to staff and farmers, implementation of M&E survey

(4) 5th year: — Implementation of training program to staff and farmers, implementation of M&E survey and review of the project

Phase II: Local fund (6th-10th year)

(6) 6th - 10th year: — Establishment of demonstration plots (50 plots x 4 years = 200 plots), implementation of training program to staff and farmers, implementation of M&E survey

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training leave the project for other appointments or new jobs in the private sector. Trainees would have to enter into a bond prior to commencement of training program agreeing to serve in public sector for a specified period following completion of training.

11. Expected Benefit

(1) Crop diversification in dry season in the irrigation area will be expanded

(2) As result of (1), the income of farmers will be enhanced.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counterpart budget for operation and maintenance cost of the project

(2) Leaving of trained staff from the project for new positions or new jobs.

13. Assessment of Natural and Social Environment

(1) Natural environment: Agro-chemicals and chemical fertilizer should be applied properly according to the technical guidance.

(2) Social environment: No impacts are expected.

14. Special Arrangements

The project should ensure access to the credit for purchasing necessary inputs for crop diversification. If no credit is available, the fund arrangement for credit will be considered in the project component.

TERMS OF REFERENCE

FOR

TECHNICAL ASSISTANCE (TA)

ON

CROP DIVERSIFICATION PROGRAM

IN

THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

1. Background and Justification

In the major plains located in the Mekong corridor agriculture production has intensified with the development of irrigated agriculture in the recent years. In order to obtain the full benefits of the investments being made in irrigation, it would be necessary to obtain higher returns through the use of improved techniques, more efficient cultivation practices and better on-farm water management. In those areas most farmers are focused on rice production only. However, self-sufficiency in rice is being reached in the region and there are surplus in the market after harvest, bringing the farm gate price of paddy down. Some farmers are complaining that with increasing price of inputs and declining prices obtained for their produce, paddy production will not be longer profitable. From the point of view of increasing the income of farmers and of securing long term viability in the farm investment, it is a prerequisite to have a program to encourage farmers to diversify into higher value crops. Unfortunately, while farmers are beginning to show interest in crops other than rice, there are still no recommendations on the best varieties, inputs and cultural practices to use for most of those crops.

A project profile for crop diversification was elaborated with the objectives to enhance farm income through the expansion of crop diversification in irrigated agriculture areas located in five provinces namely: Borikhamxai, Khammouan, Savannakhet, Saravan and Champasak. The project will be implemented by MAF with the technical assistance specified in following.

2. Objective of the Technical Assistance

The Technical Assistance aims to support the development of crop diversification through training and extension activities comprising of the preparation of crop management calendar, crop selection and establishment of demonstration plots. Other components of the project are operation and maintenance of demonstration plots, implementation of technical guidance to farmers in demonstration plots, and, implementation of training including On the Job Training for government staff.

The Technical Assistance would also provide necessary management support

during the preparation, implementation and evaluation of the project. This will also include an agricultural need assessment and the establishment of project monitoring and evaluation system. At the completion of the project, the technical assistance should be able to present important lessons learned and sound recommendations for fine tuning the project's strategic approach, implementation design and feature to sustain the follow-up or replication of the development objectives and activities after the completion of the project.

3. Scope of Work

The approach of the project is to develop crop management calendars for potential crops that would include necessary field production operations from land preparation to post harvest management. The crop calendars would be designed in relation to the capability of farmers and to the existing agricultural conditions in the project areas. The dissemination of crop production based on the established crop calendar would be made through small and farmer manageable demonstrations that would use trial species and/or adaptive technology for crop diversification. The demonstrations would be established and managed by farmers with the full support from DAFO extension staffs, and would be located in area accessible to other farmers in view of the Teaching by showing and learning by doing approaches. The demonstration plots will also serve as trial plots for adaptive technology and new species by NAFRI. The technical assistance will support the development of the activities specified above.

The Technical Assistance will ensure the well functioning of the project and the capacity building through development of skills and knowledge through training of government staff and farmers.

4. Specific Tasks

Pursuing the scope of work defined above, the technical assistance will follow the specific tasks for each main project components as below.

(1) Preparation and Planning work.

- To establish a approach and methodology for the development of crop management calendar.
- To conduct an agriculture need assessment of selected areas and selection of potential areas.
- To establish and conduct a base line socio-economic survey and Participatory Rural Appraisal of selected areas.
- To design and establish crop calendars.

(2) To provide training to DOA, PAFS and DAFO staff in development of crop diversification according to established approach and methodologies.

- To conduct a training need assessment for government staff and

farmers.

- To elaborate and implement training programs according to the TNA

(3) To support the establishment, operation and maintenance of demonstration plots in the field.

- To select potential areas for crop diversification (20 plots for the first 2 years and 80 plots for the last three years).
- To design and establish demonstration plots for selected crops

(4) To provide technical support and guidance to farmers at the established demonstration plots.

(5) To support community managed crop nursery preparation

(6) Project operation, monitoring and evaluation.

A project operation, monitoring and evaluation system, which involve capacity building of the local institution will be elaborated for implementation of the project. The technical assistance task will be:

- To ensure that outputs, outcomes and impacts emerging at each steps of the project implementation have been realized towards achieving the implementation progress and development objectives. Therefore, proper monitoring and evaluation will be conducted in relevance with the scope and work schedule of the project.
- To ensure the correct utilization of project funds including those from the local contribution through the implementation of the Project's Financial Regulations.
- To ensure the correct operation and utilization of project's facilities, equipment and materials during the overall duration of the project.

Assistance to the overall project management by the team leader will be:

- To assist the Project Director/Coordinator in the overall project management and coordination among government agencies.
- To assist the Project Director/Coordinator for the preparation of annual implementation program and budget arrangement.
- To assist the Project Director/Coordinator for monitoring the work progress of each sub-project components.
- To assist the Project Director/Coordinator for the preparation of regular progress reports.

(7) Reporting

The following reports shall be prepared and provided.

(a) Inception report

To be submitted by the end of the third month after the commencement of the technical assistance services. The report will contains overall work schedule, work plan, administrative arrangement, results the review of existing data/ information during the inception period.

(b) Monthly progress report

To be submitted at a monthly interval, which contains mobilization reports, man-months consumed, summary of work progress during the reporting month, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next month.

(c) Quarterly progress report

To be submitted at three month interval, which gives a summary of the consultant's activities, work progress during the reporting period, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next quarterly period.

(d) Annual report

To be submitted at the annual assignment, which gives a summary of the consultant's activities, work progress during the reporting period, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next year.

(e) Completion report.

To be submitted, upon completion of all services, giving all aspects related to the project management and the project works.

(f) Project management formulation report

To be prepared for reporting the current formulation status of the project management. The report will comprise of a summary of the project management system and implementation, including guideline with checklist for sub-project identification and reporting format.

(g) Specific technical reports

After the completion of each long term and/or short term assignment each individual expert will submit his/her individual technical report/note on the technical support implemented and accomplished during the period assigned to work with the project.

In addition to the individual technical reports, the following technical report will be provided as result of technical group work.

– Crop Diversification Approach and Methodologies in Lao PDR.

5. Expertise Requirements

A team of consultants, which may be and academic or research organization, or and independent consulting firm, will be engaged to undertake the consulting services as specified above. This would include international, regional and local expertise in following.

(1) Team Leader Agriculture Training and Extension Specialist (International) for a total of 40 man/months to assist in the design, establishment and implementation of crop diversification program.

(2) Agronomist / Vegetables (International) for a total of 24 man/month to assist in the implementation of the demonstration plots for vegetables, in training of government staff and in the technical support to farmers.

(3) Agronomist / Upland crops (International) for a total of 24 man/month to assist in the implementation of the demonstration plots for upland crops, in training of government staff and in the technical support to farmers.

(4) Irrigation Water Management Specialist (International) for a total of 24 man/month to assist in the implementation of water management and water user organization for the demonstration plots, in training of government staff and in the technical support to farmers.

(5) Post Harvest and Marketing (International) for a total of 12 man/month to assist in post harvest management and marketing intelligence for the crops grown under the project.

(6) Agriculture Economics (International) for a total 12 man/month to assist in the selection of crops and in crop economics calculation for crop demonstrations.

(7) Agriculture Training and Extension Specialist (regional) for a total of 36 man/month to assist the team leader in developing training and demonstration program for government staff and farmers.

(8) Training and Extension (Local) for a total of 60 man/month to assist in the design and elaboration of necessary training and in the implementation of the crop diversification program.

(9) Agronomist (Local) for a total 60 man/month to assist the in the implementation of the demonstration plots, in training of government staff and in the technical support to farmers.

(10) Water Management (Local) for a total 60 man/month to assist in the implementation of water management and water user organization for the demonstration plots, in training of government staff and in the technical support to farmers.

(11) Unspecified Backstopping Expertise to be specified in the current of the project implementation. This will include 3 man/month international, 6 man/month regional and 12 man/month local.

6. Time Frame

As specified in the project profile the time frame of the project is of 10 years. However, the time frame for the technical assistance is of 5 years. The following time frame is tentatively proposed for the mandate of the consultant team.

	Time Frame	m/m	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
1	**International**													
	Team Leader / Extension and Training	40												
	Agronomist/ Vegetables	24												
	Agronomist/ Upland crops	24												
	Irrigation water management	24												
	Post harvest and marketing	12												
	Agriculture Economics	12												
2	**Regional / volunteers**													
	Training and Extension	36												
3	**Local**													
	Training and Extension	60												
	Agronomist	60												
	Water management (1)	60												
4	**Unspecified Backstopping**													
	International	3												
	Regional	6												
	Local	12												

Project No. AC-5

1. Title of Project/Program

   Outer City Horticulture Promotion Program

2. Location

   Vientiane and Borikhamxai Provinces and Vientiane Municipality (Districts under Group5 & 7)

3. Objectives

   To enhance farm income through expansion of horticulture production in outer city area.

4. Project/Program Description

   According to the assessment result on agriculture setting by districts, Vientiane Province and Vientiane Municipality belong to Group 5 & 7. A part of Borikhamxai Province also belong to Group 5. Those groups are characterized into the followings.

Table Agriculture Setting in Group 5 and 7

Group	Describe Characteristics	Find Constraints	Clarify Target
G-5	Districts belonging to this group are located near to Vientiane city, and production of market oriented crops are considerably well developed. Irrigation system is also well developed and supports crop diversification. However, farm intensity is considerably low.	(1) Further expansion of market oriented crops is becoming difficult due to small domestic market. (2) Quality of marketing crops is still at low level for export. (3) Paddy productivity is still at low level.	(1) To develop and introduce proper cropping pattern and production technologies so as to produce high value crops throughout the year. (2) To improve qualities of products so as to increase their competitiveness. (3) To assist farmers in marketing development. (4) To improve productivity of paddy by use of proper level of inputs taking economic return into account.
G-7	Districts belong to this group are located at the suburbs of Vientiane city. Crops produced are well diversified and marketed to the largest market of Vientiane city. Irrigation facility is comparatively well developed. However, farm intensity is at medium level.	(1) Farther expansion of market oriented crops are becoming difficult due to small domestic market. (2) Quality of marketing crops is still at low level for export.	(1) To develop and introduce proper cropping pattern and production technologies so as to produce high value crops throughout the year. (2) To improve quality of products so as to increases their competitiveness.

The above table shows clearly that the introduction or expansion of high value crops including vegetables, fruits and fodder crops should be promoted, since demand of urban people, hotels, trade companies and factories increase year by year. For the vegetables, however, over supply and hence low market prices are widely observed in the dry season since many farmers cultivate vegetables using home gardens, the river banks and irrigated areas. Therefore, the introduction of new techniques, especially the adjustment of the cropping pattern and more crop

diversification is necessary to stabilize the supply of vegetables all year-round. In the fruits or fodder crops, production of those crops is rather small compared to market demand and accordingly stable market price is expected. To hedge the risk to introduction of new crops and techniques, demonstration plots and associated farmer training should be promoted in the program target area.

The proposed project will expand value added crops including vegetables, fruits and fodder crops (maize etc.) through extension service including preparation of crop management calendar, and demonstration plots and associated farmer training. The project will be carried out mainly by DAFO staff in the districts concerned with the full technical and administrative support of PAFS and DOA. The training program of DAFO and PAFS staff is important component of the project. The staff training will be made in the form of on-job training, and study tour in other countries.

In the project, crop management calendar will be prepared and the calendar would include necessary operations in the field from land preparation to post harvest management. The calendar would fit in with farmers capability and existing agricultural conditions. Moreover, the calendar will be modified from time to time on the basis of field demonstration result. Small and manageable demonstration plots using trial species and/or adaptive or new technology on value added crops will be established under the full management or guidance of extension staff of DAFO. The demonstration plot would be located in the place where farmers pass frequently and trial species and/or adaptive technology developed by NAFRI or in other neighboring countries will be applied. The demonstration plots would be centrally located and accessible to farmers. Trial species and/or adaptive technology developed by NAFRI or in other neighboring countries will be applied. The farmers would learn the technical possibilities and financial attractiveness of diversification. For propagation of demonstration plots, training for local extension staff and farmers will be implemented on the basis of “Teach by Showing” or “Learning by Doing”. For marketing development, marketing intelligence system, which is currently establishing in DOA, will be utilized fully. In addition, formulation of production group will be considered to enhance bargain power.

Expected technical inputs are: i) overall project management (training and extension), ii) agronomist, iii) post harvest and marketing, iv) institution, v) agro-economist.

In the fifth year of the program, the progress and project impact will be reviewed and the program design will be modified, if necessary. The government will continue program using own budget on the basis of recommendation made by review study. The program is expected to continue till the 10^{th} year at least.

5. Project Components

(1) Technical assistance for overall project management, preparation of crop

management calendar, selection, design and establishment of demonstration plots,

(2) Implementation of training program for DOA, PAFS and DAFO staff,

(3) Operation and maintenance of demonstration plots by DAFO staff

(4) Implementation of technical guidance to farmers in the demonstration plots,

(5) Technical assistance for formulation of production groups and marketing, and

(6) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&E) survey.

6. Project Costs

Total project cost is US$ 3,755 thousand consists of US$ 3,047 thousand for phase I and US$ 728 thousand for phase II (local fund only). The detailed is shown below:

Phase I (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	689	649	340	241	231	2,150
Recurrent Cost	112	205	196	193	192	897
Total	801	854	536	434	423	3,047

Phase II (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	10	10	10	10	0	40
Recurrent Cost	138	138	138	138	137	688
Total	148	148	148	148	137	728

7. Implementing Agency

(1) Department of Agriculture (DOA), Ministry of Agriculture and Forestry

(2) Provincial Agriculture and Forestry Services (PAFSs) in Vientiane and Borikhamxai Provinces and Vientiane Municipality

(3) District Agriculture and Forestry Offices (DAFOs), to be named in the initial stage of the project

8. Organizational and Staffing Requirements

The required number of staff is 72 in total and additional staff will be not required. The details are shown below:

	Required Staff
1. DOA	3
2. Staff in Province	9
3. DAFO Project Staff	60
Total	72

9. Implementation Schedule

The program will be implemented in 10 years consists of 5 years for phase I (donor-assisted) and 5 years for phase II (local fund only) according to the following schedule.

Phase I: Donor assisted (1^{st}-5^{th} year)

(1) 1^{st} Year: Preparatory period for planning, implementation of agricultural needs assessment and baseline survey, preparation of draft crop management calendar, implementation of training program to staff

(2) 2^{nd} Year Establishment of demonstration plots (10 plots), implementation of training program to staff and farmers

(3) 3^{rd} - 4^{th} year: Establishment of demonstration plots (25 plots x 2 years = 50 plots), implementation of training program to staff and farmers, establishment of pilot production groups, implementation of M&E survey

(4) 5^{th} year: Implementation of training program to staff and farmers, implementation of M&E survey and review of the project

Phase II: local fund (6^{th}-10^{th} year)

(6) 6^{th} - 10^{th} year: Establishment of demonstration plots (30 plots x 4 years = 120 plots), implementation of training program to staff and farmers, further establishment of production groups, implementation of M&E survey

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training program leave project for appointment of new jobs in the private sector. Trainee would have to enter into bond prior to commence of training program agreeing to serve in public sector for a specified period following completion of training.

Some irrigation area is converted to housing yard in suburban area due to urbanization. To avoid the waste of investment, the establishment of demonstration plots should be considered carefully in this aspect. The lease contract with land owners for demonstration plots during program period will be required.

11. Expected Benefit

    (1) The cultivated area of value added crops in outer city area is expanded

    (2) As result of the above, income of farmers is enhanced.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    (1) Shortage of government counterpart budget for operation and maintenance cost of the project

    (2) Leaving trained staff form the project for assignment of new position or new jobs.

13. Assessment of Natural and Social Environment

    (1) Natural environment: Agro-chemicals and chemical fertilizer should be applied properly according to the technical guidance.

    (2) Social environment: No impacts are expected.

14. Special Arrangements

    The project should ensure access to the credit for purchasing necessary inputs for crop diversification. If any credit is not available, the fund arrangement for credit will be considered in the project component.

TERMS OF REFERENCE

FOR

THE OUTER CITY HORTICULTURE PROMOTION PROGRAM

IN

LAO PEOPLE'S DEMOCRATIC REPUBLIC

1. Background and Justification

In the plains located in the Upper Mekong Corridor agriculture production has intensified with the development of irrigated agriculture and with the expansion of market oriented crop production for supplying the demand of the large urban agglomerations such as Vientiane Municipality and Louangphrabang. In order to obtain full benefit from farm investments being made by the farmers, it would be necessary to obtain higher result through the use of improved techniques, more efficient cultivation practices and more market oriented production alternatives. In those areas farmers have already diversified cropping and intensified their production, especially in the districts located in the outer of Vientiane Municipality. However, the market oriented production is difficult to expand due to the limited knowledge of farmers in the selection of product, in adapting their cropping patterns, and in the production of quality products in relation to the demand of the market. At present, there are seasonal over supplies of vegetables, fruits and grains/cereals crops and there is importation of quality products for the service industry (hotel and restaurants) and for the urban market. From the point of view of securing long term viability in farm investment and of reducing importation of agricultural products it is a necessity to have a project to support horticulture production in the outer city areas.

A project profile for horticulture promotion was elaborated with the objectives to enhance farm income through the expansion of horticulture production in agriculture areas located in five provinces namely: Bolikahmxai, Louangprabang, Vientiane provinces and in Vientiane Municipality. The project will be implemented by MAF with the technical assistance specified in following.

2. Objective of the Technical Assistance

The Technical Assistance aims to support the development of horticulture production in outer city areas through training and extension activities comprising of the preparation of crop management calendar, crop selection and establishment of demonstration plots. Other components of the project are the operation and maintenance of demonstration plots, implementation of technical guidance to farmers in demonstration plots, and, implementation of training including On the Job Training for government staff.

The Technical Assistance would also provide necessary management support

during the preparation, implementation and evaluation of the project. This will also include an agricultural need assessment and the establishment of project monitoring and evaluation system. At the completion of the project, the technical assistance should be able to present important lessons learned and sound recommendations for fine tuning the project's strategic approach, implementation design and feature to sustain the follow-up or replication of the development objectives and activities after the completion of the project.

3. Scope of Work

The approach of the project is to develop crop management calendars for potential crops (vegetables, cash crops (including fodder crops), fruits etc.) that would include necessary field production operations from land preparation to post harvest management. The crop calendars would be designed in relation to the capacity of farmers and to the existing agricultural conditions in the project areas. The dissemination of crop production based on the established crop calendar would be made through small and farmer manageable demonstrations that would use trial species and/or adaptive technology for crop diversification. The demonstrations would be established and managed by farmers with the full support from DAFO extension staffs, and would be located in area accessible to other farmers in view of the teaching by showing and learning by doing approaches. The demonstration plots will also serve as trial plots for adaptive technology and new species by NAFRI. The technical assistance will support the development of the activities specified above.

The Technical Assistance would also provide necessary support in term of management during the preparation, implementation and evaluation of the project. At the completion of the project, the technical assistance should be able to present important lessons learned and sound recommendations for fine tuning the project's strategic approach, implementation design and feature to sustain the follow-up or replication of the development objectives and activities after the completion of the project.

4. Specific Tasks

Pursuing the scope of work defined above, the technical assistance will follow the specific tasks for each main project components as below.

(1) Preparation and Planning work.

- To establish a approach and methodology for the development of crop management calendar.
- To conduct an agriculture need assessment of selected areas and selection of potential areas.
- To establish and conduct a base line socio-economic survey and Participatory Rural Appraisal of selected areas.

- To design and establish crop calendars.

(2) To provide training to DOA, PAFS and DAFO staff in development of crop diversification according to established approach and methodologies.

- To conduct a training need assessment for government staff and farmers.
- To elaborate and implement training programs according to the TNA

(3) To support the establishment, operation and maintenance of demonstration plots in the field.

- To select potential areas for crop diversification (10 plots for the first 2 years and 50 plots for the last three years).
- To design and establish demonstration plots for selected crops

(4) To provide technical support and guidance to farmers at the established demonstration plots.

(5) To support community managed crop nursery preparation

(6) Project operation, monitoring and evaluation.

A project operation, monitoring and evaluation system, which involve capacity building of the local institution will be elaborated for implementation of the project. The technical assistance task will be:

- To ensure that outputs, outcomes and impacts emerging at each steps of the project implementation have been realized towards achieving the implementation progress and development objectives. Therefore, proper monitoring and evaluation will be conducted in relevance with the scope and work schedule of the project.
- To ensure the correct utilization of project funds including those from the local contribution through the implementation of the Project's Financial Regulations.
- To ensure the correct operation and utilization of project's facilities, equipment and materials during the overall duration of the project.

(7) Assistance to the overall project management by the team leader will be:

- To assist the Project Director/Coordinator in the overall project management and coordination among government agencies.
- To assist the Project Director/Coordinator for the preparation of annual implementation program and budget arrangement.
- To assist the Project Director/Coordinator for monitoring the work progress of each sub-project components.
- To assist the Project Director/Coordinator for the preparation of

regular progress reports.

(8) Reporting

The following reports shall be prepared and provided.

(h) Inception report

To be submitted by the end of the third month after the commencement of the technical assistance services. The report will contains overall work schedule, work plan, administrative arrangement, results the review of existing data/ information during the inception period.

(i) Monthly progress report

To be submitted at a monthly interval, which contains mobilization reports, man-months consumed, summary of work progress during the reporting month, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next month.

(j) Quarterly progress report

To be submitted at three month interval, which gives a summary of the consultant's activities, work progress during the reporting period, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next quarterly period.

(k) Annual report

To be submitted at the annual assignment, which gives a summary of the consultant's activities, work progress during the reporting period, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next year.

(l) Completion report.

To be submitted, upon completion of all services, giving all aspects related to the project management and the project works.

(m) Project management formulation report

To be prepared for reporting the current formulation status of the project management. The report will comprise of a summary of the project management system and implementation, including guideline with checklist for sub-project identification and reporting format.

(n) Specific technical reports

After the completion of each long term and/or short term assignment

each individual expert will submit his/her individual technical report/note on the technical support implemented and accomplished during the period assigned to work with the project.

In addition to the individual technical reports, the following technical report will be provided as result of technical group work.

– Horticulture Promotion in the Outer City Areas of Lao PDR.

5. Expertise Requirements

A team of consultants, which may be and academic or research organization, or and independent consulting firm, will be engaged to undertake the consulting services as specified above. This would include international, regional and local expertise in following.

(1) Team Leader Agriculture Training and Extension Specialist (International) for a total of 40 man/months to assist in the design, establishment and implementation of outer city crop promotion program.

(2) Horticulturist (International) for a total of 36 man/month to assist in the implementation of the demonstration plots for vegetables and crops, in training of government staff and in the technical support to farmers.

(3) Institution Specialist (International) for a total of 24 man/month to assist in the institutionalization of the project activities in the normal government institution system including strengthening of farmers organization.

(4) Post Harvest and Marketing (International) for a total of 24 man/month to assist in post harvest management and marketing intelligence for the crops grown under the project.

(5) Agriculture Economics (International) for a total 24 man/month to assist in the market intelligence of crops, selection of crops and in crop economics calculation for crop demonstrations.

(6) Agriculture Training and Extension Specialist (regional) for a total of 36 man/month to assist the team leader in developing training and demonstration program for government staff and farmers.

(7) Training and Extension (Local) for a total of 60 man/month to assist in the design and elaboration of necessary training and in the implementation of the crop diversification program.

(8) Agronomist (Local) for a total 60 man/month to assist the in the implementation of the demonstration plots, in training of government staff and in the technical support to farmers.

(9) Unspecified Backstopping Expertise to be specified in the current of the project implementation. This will include 3 man/month international, 6 man/month regional and 12 man/month local.

6. Time Frame

As specified in the project profile the time frame of the project is of 10 years. However, the time frame for the technical assistance is of 5 years. The following time frame is tentatively proposed for the mandate of the consultant team.

	Time Frame	m/m	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
1	**International**													
	Team Leader / Extension and Training	40												
	Horticulturist	36												
	Post harvest and marketing	24												
	Institution development	24												
	Agriculture Economics	24												
2	**Regional / volunteers**													
	Training and Extension	36												
3	**Local**													
	Training and Extension	60												
	Agronomist	60												
4	**Unspecified Backstopping**													
	International	3												
	Regional	6												
	Local	12												

Project No. AC-7

1. Title of Project/Program

   Export Oriented Crop Promotion Program

2. Location

   Xaignabouri, Bokeo, Louangnamtha and Xiangkhouang provinces

3. Objectives

   To expand export oriented crop production including agro-processed products in border provinces.

4. Project/Program Description

   Border trade of crop products widely is carried out in border provinces to China, Thailand, and Vietnam. However, the actual volume of border trade is not known, since considerable border trade is made unofficially, the limited reports only partially show a the actual exports in the border provinces. In Xaignabouri province, for example, cotton, peanut, beans, maize, tamarin and various vegetables cultivated in the southern region of the province for export to Thailand. In the Kenethao distinct in Xaignabouri province, more than 90% of income come from such cash crop productions. The other three provinces also export agriculture products to other countries to some extent. However, those provinces need to utilize the advantage of their location more to increase the exports for both agriculture and agro-processed products.

   The proposed project will expand crop and agro-processing production in the border provinces through extension service including preparation of crop management calendar, and demonstration plots and associated farmer training. However, the present conditions as well as potential crops are not clear for export crops. It is therefore proposed that the study should be carried out to clarify the present export conditions, selection of potential crops and to prepare a development plan including agro-processing. After the study, the project will be carried out mainly by DAFO staff in the districts concerned with the full technical and administrative support of PAFS and DOA. The training program for DAFO and PAFS staff is an important component of the project. The staff training will be made in the form of on-job training, and study tours to other countries. In addition to extension survive, a participatory approach will be applied to establish community agro-processing units under the full technical assistance of DAFO staff.

   In the project, crop management calendar will be prepared and the calendar would include necessary operations in the field from land preparation to post harvest management. The calendar should fit in with farmers capability and existing agricultural conditions of the border provinces. Moreover, the calendar would be

modified from time to time on the basis of field demonstration result. Small and manageable demonstration plots using trial species and/or adaptive technology on crop diversification will be established under the full management or guidance of extension staff of DAFO. The demonstration plots would be centrally located with easy access to farmers. Trial species and/or adaptive technology developed by NAFRI or in other neighboring countries will be applied. The farmers would learn the technical possibilities and financial attractiveness of diversification. For propagation of demonstration plots, training for local extension staff and farmers will be implemented on the basis of "Teach by Showing" or "Learning by Doing".

The agro-processing activities are also important components of the program to add more value. The public orientation program will be made to explain how to participate in the community managed agro-processing unit (CMAU). The initial inputs including equipment and materials will be provided to the community. The cost of those inputs will be subsidized to some extent. However, the scale of subsidy will be examined carefully considering government policy and subsidy condition of other projects.

Expected technical inputs are: i) overall project management (training and extension), ii) agronomist, iii) post harvest and agro-processing, iv) community development for agro-processing unit, v) agro-economist, vi) marketing during study period only.

In the sixth year of the program, the progress and project impact will be reviewed and the program design will be modified, if necessary. The government will continue program using own budget on the basis of recommendation made by review study. The program is expected to continue till the 10^{th} year at least.

5. Project Components

(1) Technical assistance for study on export oriented agriculture development in border provinces,

(2) Technical assistance for overall project management, preparation of crop management calendar, and establishment of demonstration plots,

(3) Implementation of training program for DOA, PAFS and DAFO staff,

(4) Operation and maintenance of demonstration plots by DAFO staff,

(5) Implementation of technical guidance to farmers in the demonstration plots,

(6) Technical assistance for formulation of community managed agro-processing unit (CMAU), and

(7) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&E) survey.

6. Project Costs

Total project cost is US$ 5,498 thousand consisting of US$ 4,715 thousand for phase I and US$ 783 thousand for phase II (local fund only). The detailed breakdown is shown below:

Phase I (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	Total
Capital Expenditure	900	853	603	374	275	255	3,260
Procurement of Equipment	45	293	286	279	276	275	1,455
Total	945	1,146	889	653	551	530	4,715

Phase II (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	Total
Capital Expenditure	20	20	20	0	60
Procurement of Equipment	181	181	181	180	723
Total	201	201	201	180	783

7. Implementing Agency

(1) Department of Agriculture (DOA), Ministry of Agriculture and Forestry

(2) Provincial Agriculture and Forestry Services (PAFSs) in Xaignabouri, Bokeo, Louangnamtha and Xiangkhouang provinces

(3) District Agriculture and Forestry Offices (DAFOs), to be named in the initial stage of the project

8. Organizational and Staffing Requirements

The required number of staff is 75 in total and additional staff will not be required. The details are shown below:

	Required Staff
1. DOA	3
2. Staff in Province	12
3. DAFO Project Staff	60
Total	75

9. Implementation Schedule

The program will be implemented in 10 years consisting of one year for donor-assisted study, 5 years for donor-assisted project implementation and 4 years for funding under the national budget according to the following schedule.

Study period (1st year)

(1) 1st Year: Study for present condition of agriculture and trade, planning on exported oriented crop promotion including detailed implementation schedule, implementation of agricultural needs assessment and baseline survey.

Phase I: Donor assisted (2nd-6th year)

(2) 2ndYear: Preparatory period for establishment of demonstration plots, preparation of draft crop management calendar,

implementation of training program to staff

(3) 3rd Year — Establishment of demonstration plots (20 plots), implementation of training program to staff and farmers

(4) 4th - 5th year: — Establishment of demonstration plots (50 plots x 2 years = 100 plots), implementation of training program to staff and farmers, establishment of community managed agro-processing unit (CMAU), implementation of M&E survey

(5) 6th year: — Implementation of training program to staff and farmers, establishment of community managed agro-processing unit (CMAU), implementation of M&E survey and review of the project

Phase II: Local fund (7th-10th year)

(6) 7th - 10th year: — Establishment of demonstration plots (50 plots x 3 years = 150 plots), implementation of training program to staff and farmers, further establishment of community managed agro-processing unit (CMAU), implementation of M&E survey

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training program leave the project for other appointments or new jobs in the private sector. Trainees would need to enter into a bond prior to commencing their training program agreeing to serve in the public sector for a specified period following completion of training.

11. Expected Benefit

(1) The cultivated area of crops as well as agro-processing of crops in border provinces will be expanded,

(2) As result of the above, provincial export income as well as household income of farmers are enhanced.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counterpart budget for operation and maintenance cost of the project

(2) Leaving of trained staff from the project for assignment of new position or new jobs.

13. Assessment of Natural and Social Environment

(1) Natural environment: Agro-chemicals and chemical fertilizer should be applied properly according to the technical guidance.

(2) Social environment: No impacts are expected.

14. Special Arrangements

Demarcation of areas with projects for the stabilization of shifting cultivation should be confirmed prior to implementation of the project.

TERMS OF REFERENCE

FOR

MASTER PLAN

ON

EXPORT ORIENTED CROP PROMOTION PROGRAM

IN THE NORTHERN REGION

OF

LAO PEOPLE'S DEMOCRATIC REPUBLIC

1. Background and Justification

Trading of agricultural products through border trade is widely carried out in the northern provinces bordering China, Thailand, and Vietnam. At present, the trade volume is not known, because of considerable non-formal border trade. In Xayabouri province cotton, peanut, beans, maize, tamarin and various vegetables are cultivated in the southern region of the province for export to Thailand. Kenethao District itself counts more than 90% of its revenue from the export oriented cash crop productions. In Bokeo, Louangnamtha and Xiangkhouang are also some export based production of agricultural products to a limited extend. However, production oriented to exportation is not well developed and organized. It presents some market irregularities and uncertainties. There have been cases of over production in many areas and drop of prices of exportable agricultural products. There are many problems and constrains related to the organization of the production and the marketing of potential product for export.

Nevertheless, There exist some potentials for promoting crop production for export in relation to the strategic location of the northern part of Laos and the availability of agricultural resources and potential in the areas. A project profile for export oriented crop promotion was elaborated with the objective to expand export oriented crop production and agro-processed products in some of the northern provinces bordering Thailand, China and Vietnam. Because there are limited information and limited study about the areas it is proposed to conduct and Master Plan and Feasibility Study in order to elaborate a long term development program of the development of export based agricultural production. The Master Plan Study will be implemented with the technical assistance specified in following.

2. Objective of the Study

The Objectives of the study are to formulate a strategic and comprehensive development master plan for the expansion of export oriented crop production including agro-processed products in the four (4) provinces located in Northern Laos and to carry out a feasibility on selected priority projects.

3. Study Area

The study area covers four (4) provinces namely: Phongsali, Bokeo, Louangnamtha and Xiangkhouang located in the northern part of Lao PDR, which are bordering Thailand, China and Vietnam

4. Scope of the Study

4.1 General

The scope of the study will be as follows:

(a). Master plan study for the four provinces of Phongsali, Bokeo, Louangnamtha and Xiangkhouang.

(b). Feasibility study for priority projects, which will be selected in line with the Master Plan.

The study will be carried out in the following two phases:

Phase-I: Master Plan Study

Field Work-I: Data Collection, field survey and investigation and formulation of basic development plan.

Home Work-I: Analysis, study and preparation of Master Plan Report. (Interim Report).

Phase-II: Feasibility Study

Field Work-II: Supplementary data collection, field survey and investigations mainly for the priority project areas.

Home Work-II: Analysis, study and preparation on Feasibility Report. (Draft Final Report).

4.2 Detailed Scope of the Study.

Phase-I: Master Plan Study

Field Work-I

Data collection and review on:

(a). Existing project studies on the Study Areas,

(i) Natural resources including topography, meteorology, hydrology, salinity and soils,

(ii) Socio-economy including population and number of households, social structure, income, living standards, national and regional development plans, national and regional economy and organizational structure of regional government,

(iii) Agriculture including land use, cropped area, cropping pattern, crop varieties, unit yields, farming practices and land holding

system,

(iv) Agro-economy including price of products, price of farm inputs and farm economy,

(v) Farmer organization and agricultural supporting system including farm management system, water management system, communal cooperatives society system, agricultural research, agricultural credit system, agricultural extension and other supporting services.

(vi) Marketing system including marketing channels, marketing structure price of products at diverse exchange point, border trade point (formal and informal) price volume and quantity, legal and regulatory framework of products,

(vii) Water resource management including irrigation facilities, design criteria, information of operation and maintenance and water management,

(viii) Rural infrastructure including village road, farm road, domestic water supply system, post-harvest and storage facilities, and

(ix) Environment including ecosystem, flood control, soil erosion, water quality, and historical cultural assets.

(b). Field survey and basic study including:

(i) Review on the existing projects and studies on the Study Areas,

(ii) Socio-economic survey including review of national and regional development plans, survey on social structure of villages, living standard of villagers, gender issues, women's participation in social activities, and NGOs' activities,

(iii) Agricultural and agro-economic survey including interview survey to farmers for the collection of information on family size, income, monthly expenses, living condition, farming practices and farmer's desire and intention to agricultural and rural development, and survey on present conditions and constraints of the agricultural support services,

(iv) Marketing survey of agricultural products including domestic trade and formal and non-formal border trade between neighboring countries and analysis of potential crops for export, survey of existing market structure and channels.

(v) Soil and land use survey including reconnaissance and auger boring to confirm the information shown in the existing soil map and field check of present land use using the existing topographic maps,

(vi) Geological survey including review of existing geological study, confirmation of existing well location and check water quality,

(vii) Irrigation and drainage survey including survey on present irrigation and drainage networks and on-farm facilities, operation and maintenance condition, activities of water users' organization and water charge collection,

(viii) Rural infrastructure survey including survey on present condition of village roads and farm roads, domestic water supply system, post-harvest and storage facility, agro-processing facility.

(ix) Environmental survey including survey on condition of water pollution, ecosystem, flood control, soil erosion, and confirmation of endangered animal specie and historical and culture assets, and

(c). Preparation of progress report (I), which will describe the experts' activities, the results of the field survey and basic consideration for the future study for the formulation of master plan.

Home-Work-I

(a). Evaluation of development potentials, needs and clarification of present constraints for the future agricultural and marketing development.

(b). Formulation of development strategies consisting of:

(i) Agricultural development plan including recommendable land use, recommendable crops and cropping pattern, modernized farming practices, and expected farm income after project implementation.

(ii) Agriculture supporting strengthening plan including establishment of farmers farmer organizations, on-farm development, irrigation water management and O&M and strengthening of agricultural support system,

(iii) Marketing system development plan including market intelligence development, and export promotion plan for agricultural products including processed products.

(iv) Rural infrastructure development plan including construction of irrigation infrastructure, road network and farm roads, construction of post harvest and storage facilities, establishment of agro-processing facilities,

(v) Environmental assessment and plan for environmental conservation,

(vi) Estimation of project implementation cost,

(vii) Project evaluation from technical and economical viewpoints,

(viii) Preparation of overall development program, and

(ix) Selection of priority projects in line with overall development program.

(c). Preparation of Master Plan Report (Interim Report) which will describe the study results and recommended development plan of the project.

Field Work-II

(a). Supplemental data collection, if any.

(b). Field survey and basic study including:

(i) Soil and land use survey using satellite imagery and topographic map,

(ii) Agricultural and agro-economic survey for the following items:

- Crop, crop variety, cropping pattern and livestock,
- Crop production,
- Trend and demand supply of agricultural products in domestic market,
- Trend and demand supply of agricultural products in export market including non formal border trade,
- Farming practice and mechanization,
- Labor balance on farming practices,
- Profitability and marketability of crops and livestock including processed products,
- Post-harvest and agro-processing
- Marketing, handling, sorting/packing and grading, transport and storage, and institutional constraints to the project development.

(iii) Survey on agricultural support system for the following issue:

- Agricultural support system to introduce new exportable crops and cultivation methods including development of pilot farms and demonstration plots,
- Research and extension,
- Agricultural credit,
- Present activities and financial situation of organizations

and institutions for the agricultural support system, and

– Constraints to the agricultural development.

(iv) Survey on rural infrastructure particularly village road network and farm roads, post-harvest and storage facilities, and agro-processing facilities,

(v) Cost survey for construction, equipment and labor, and

(vi) Expert activities, the results of field survey and basic consideration for the future study for the formulation of the feasibility study.

Home Work-II

(a). Formulation of development plan consisting of:

(i) Agricultural development plan including recommendable land use, recommendable crops and cropping pattern, modernized farming practices, and expected farm income after implementation of the project,

(ii) Agriculture supporting strengthening plan including establishment of farmer organizations, improved marketing system, and strengthening agricultural support system,

(iii) Rural infrastructure development plan including construction of irrigation infrastructure, construction of village road network and farm roads, construction of post-harvest and storage facilities, establishment of agro-processing activities,

(iv) Preparation of project implementation program,

(x) Elaborate the Term of Reference for the Technical Assistance necessary for the project.

(v) Estimation of project cost, and

(vi) Project evaluation from technical and economical viewpoints.

(b). Preparation of Feasibility Report which will describe the study results and recommended development plan and justification of the project.

5. Transfer of Technology

Throughout the course of the study, transfer of technology and training will be provided to counterpart experts by foreign experts. The transfer of technology will be carried out in form of on-the job training during the course of the study. In addition to the above transfer of technology, overseas training will also be programmed preferably in Japan.

6. Expertise Requirements and Schedule of the Study

A team of experts, which may be and academic or research organization, or and independent consulting firm, will be engaged to undertake the consulting services as specified above. The required manpower is estimated at a total 90 man-months for a period of twelve (12) months specified in Figure-1. The Study Team will consist of the following experts:

- Team leader / Agro-economist
- Agronomist
- Institutional Development Expert
- Community Social and Cultural Development Expert
- Marketing Expert
- Agro-processing Expert
- Land Use/Soil Expert
- Rural Infrastructure Development Expert
- Design/Cost Estimate Engineer
- Project Evaluation Expert

7. Reports

JICA shall prepare and submit the following reports in English to the Government of the Lao PDR. Timing of submission for each report might be changed according to the Study Schedule.

(1) Inception Report
Thirty (30) copies at the commencement of the Study.

(2) Progress Report No.1
Thirty (30) copies at the end of the Phase-I study in Lao PDR.

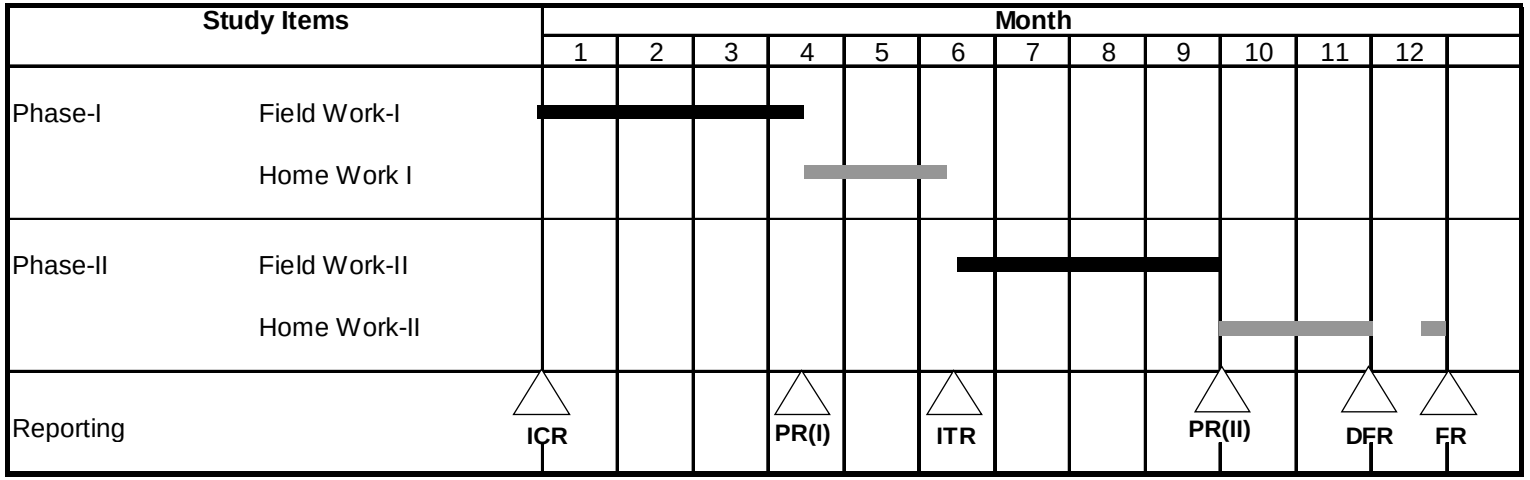
(3) Interim Report
Thirty (30) copies at the commencement of the Phase-II field study in Lao PDR.

(4) Progress Report No.2
Thirty (30) copies at the end of the Phase-II study in Lao PDR.

(5) Draft Final Report
Thirty (30) copies after the Phase-II home office work. Government of Lao PDR provides JICA with its comments on the Draft Final Report within one (1) month after receipt of the Draft Final Report.

(6) Final Report
Sixty (60) copies within two (2) months after receipt of the Government of Lao PDR comments on the Draft Final Report.

Figure-1 Tentative Work Schedule



Note: : Work in Lao PDR

: Work in Japan

ICR : Inception Report
PR (I) : Progress Report (I)
ITR : Interim Report
PR (II : Progress Report (II)
DFR : Draft Final Report
FR : Final Report

Project No. AC-8

1. Title of Project/Program

   Fruits Crop Promotion Program in Northern Region

2. Location

   Upland and mountainous areas in Louangphrabang, Oudomxai, Phongsali provinces (Group 1, 2 & 8).

3. Objectives

   To generate additional farm income through introduction or expansion of fruit cultivation in upland and mountainous areas in North region

4. Project/Program Description

   The agriculture census data shows that cropping intensity of upland rice is more than 50 % in Louangphrabang, Oudomxai and Phongsali provinces, and shifting cultivation is frequently practiced in those provinces. The assessment of agriculture setting by districts showed that upland and mountainous areas in the three provinces belong to Group 1, 2 & 8. Those groups are characterized by the following.

Table Agriculture Setting in Group 1, 2 and 8

Group	Describe Characteristics	Find Constraints	Clarify Target
G-1	Shifting cultivation is widely practiced on sloping land for production of upland paddy. In order to supplement a lower productivity, non-paddy products (including livestock and home manufacturing products) are produced and marketed to a certain extent. Expansion of irrigation area mainly for lowland paddy production is at mid to low level. Resource management is poor and depletion is high. Farming intensity is at mid to low level, and diversification is at mid to high level.	(1) Domination of unsustainable shifting cultivation which is a cause of reduction of forest cover, soil erosion, etc. (2) Food crops are insufficiently produced. (3) Productivity of non-paddy crops is low, although they are important for cash income source. (4) Production and marketing infrastructure is poorly developed. (5) Degree of market orientation is still at medium level.	(1) To prevent expansion of shifting cultivation, (2) To develop adequate production system for sustainable use of upland. (3) To promote production of cash crops to increase farmers' income both in upland and lowland. (4) To provide production and marketing infrastructure. (5) To improve productivity of lowland paddy.
G-2	Shifting cultivation for upland paddy production is widely practiced similar to G-1. In addition, production of lowland paddy with irrigation is practiced in considerably large area. Development of crop diversification is lower than G-1. However, access to markets is better than G-1. Farm intensity is higher than G-1, at medium level.	(1) Domination of unsustainable shifting cultivation which is a cause of reduction of forest cover, soil erosion, etc. (2) Mono-culture-type paddy production is dominant particularly on lowland area, (3) Production is less diversified.	(1) To prevent expansion of shifting cultivation, (2) To develop adequate production system for sustainable use of upland, (3) To promote production of cash crops to increase farmers' income, (4) To provide production and marketing infrastructure. (5) To improve productivity of lowland paddy and promote its diversification.

G-8	Agricultural setting of this group is similar with that in G-1. However, products are more diversified than those in G-1. Most of products are for home consumption and they are rarely marketed. Farm intensity is comparatively low.	(1) Domination of unsustainable shifting cultivation which is a cause of reduction of forest cover, soil erosion, etc. (2) Subsistence agriculture is predominant. (3) Food crops are insufficiently produced. (4) Development of production and marketing infrastructure is poor. (5) Marketing accessibility is poor.	(1) To prevent expansion of shifting cultivation, (2) To develop adequate production system for sustainable use of upland. (3) To promote production of cash crops to increase farmers' income. (4) To provide production and marketing infrastructure.

The above table shows that priority should be given to increasing farm income in the program area to stabilize the shifting cultivation. In this regard, fruit crop cultivation is an attractive alternatives to shifting cultivation from the viewpoint of net crop income. Moreover, cultivation of fruits tree crops is expected to have positive effect of soil erosion prevention in slope areas.

The proposed project will expand fruit crop cultivation in the upland and mountainous area through extension service including preparation of crop management calendar, and demonstration plots and associated farmer training. The project will be carried out mainly by DAFO staff in the districts concerned with the full technical and administrative support of PAFS and DOA. The training program of DAFO and PAFS staff is an important component of the project. The staff training will be made in the form of on-job training, and study tours to other countries. In addition to the extension service, a participatory approach will be applied to establish a community nursery under the full technical assistance of DAFO staff.

A crop management calendar will be prepared that would include necessary field operations from land preparation to post harvest management. The calendar would fit in with farmers capability and existing agricultural condition of the upland and mountainous area. Moreover, the calendar will be modified from time to time on the basis of field demonstration results. Small and manageable demonstration plots using trial species and/or adaptive technology on crop diversification will be established under the full management or guidance of extension staff of DAFO. The demonstration plots would be centrally located and accessible to farmers. Trial species and/or adaptive technology developed by NAFRI or in other neighboring countries will be applied. The farmers would learn the technical possibilities and financial attractiveness of diversification. For propagation of demonstration plots, training for local extension staff and farmers will be implemented on the basis of "Teach by Showing" or "Learning by Doing".

The nursery preparation of fruit crops is also an important component in the program. The public orientation program will be made to explain how to participate the community managed nursery preparation (CMNP). The initial inputs including seeds/plant materials and fertilizer will be provided to community. The cost of those inputs will be subsidized to some extent. However, the scale of subsidy will be examined carefully considering government policy and subsidy condition of other projects.

Expected technical inputs are: i) overall project management (training and extension), ii) agronomist (fruits crop), iii) post harvest and marketing, iv) community nursery management, v) agro-economist.

In the sixth year of the program, the progress and project impact will be reviewed and the program design will be modified, if necessary. The government will continue the program using its own budget on the basis of recommendations made by the review study. The program is expected to continue till the 10th year at least.

5. Project Components

(1) Technical assistance for overall project management, preparation of crop management calendar, selection, design and establishment of demonstration plots,

(2) Implementation of training program for DOA, PAFS and DAFO staff,

(3) Operation and maintenance of demonstration plots by DAFO staff,

(4) Implementation of technical guidance to farmers in the demonstration plots,

(5) Technical assistance for formulation of production groups and marketing, and

(6) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&E) survey.

6. Project Costs

Total project cost is US$ 4,414 thousand consists of US$ 3,965 thousand for phase I and US$ 449 thousand for phase II (local fund only). The detailed is shown below:

Phase I (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	Total
Capital Cost	724	524	384	384	269	257	2,542
Recurrent Cost	163	284	279	279	276	142	1,423
Total	887	808	663	663	545	399	3,965

Phase II (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	Total
Capital Cost	12	12	12	0	36
Recurrent Cost	103	103	103	103	413
Total	115	115	115	103	449

7. Implementing Agency

(1) Department of Agriculture (DOA), Ministry of Agriculture and Forestry

(2) Provincial Agriculture and Forestry Services (PAFSs) in Louangphrabang, Oudomxai and Phongsali provinces

(3) District Agriculture and Forestry Offices (DAFOs), to be named in the initial stage of the project

8. Organizational and Staffing Requirements

The required number of staff is 102 in total and additional staff will not be required. The details are shown below:

	Required Staff
1. DOA	3
2. Staff in Province	9
3. DAFO Project Staff	90
Total	102

9. Implementation Schedule

The program will be implemented over 10 years consisting of 6 years for phase I (donor-assisted) and 4 years for phase II (local fund only) according to the following schedule.

Phase I: Donor assisted (1^{st}-6^{th} year)

(1) 1^{st} Year: Preparatory period for planning, implementation of agricultural needs assessment and baseline survey, preparation of draft crop management calendar, implementation of training program to staff

(2) 2^{nd} Year Establishment of demonstration plots (10 plots), implementation of training program to staff and farmers

(3) 3^{rd} - 5^{th} year: Establishment of demonstration plots (25 plots x 2 years + 30 plots x 1 years = 80 plots), implementation of training program to staff and farmers, establishment of community managed nursery preparation (CMNP), implementation of M&E survey

(4) 6^{th} year: Implementation of training program to staff and farmers, establishment of community managed nursery preparation (CMNP), implementation of M&E survey and review of the project

Phase II: local fund (7^{th}-10^{th} year)

(6) 7^{th} - 10^{th} year: Establishment of demonstration plots (30 plots x 3 years = 90 plots), implementation of training program to staff and farmers, further establishment of community managed nursery preparation (CMNP), implementation of M&E survey

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training leave the project for appointment of new jobs in the private sector. Trainees would need to enter into a bond prior to commencing training agreeing to serve in public sector for a specified period following completion of training.

11. Expected Benefit

(1) The cultivated area of value added crops in suburban area would be expanded

(2) As result of (1), income of farmers is enhanced.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counterpart budget for operation and maintenance cost of the project

(2) Leaving of trained staff for new assignment or new jobs.

13. Assessment of Natural and Social Environment

(1) Natural environment: Agro-chemicals and chemical fertilizer should be applied properly according to the technical guidance.

(2) Social environment: No impacts are expected.

14. Special Arrangements

Demarcation of areas with projects for stabilization of shifting cultivation should be confirmed and considered prior to implementation of the project.

Xaisomboun province may be added to the project area if security conditions are improved and donor accepted such condition. If so, the costs and necessary staff numbers should be revised.

Project No. AC-9

1. Title of Project/Program

   Fruits Crop Promotion Program in Southern Region

2. Location

   Upland and mountainous areas in Xekong and Attapu provinces (Group 1 & 6).

3. Objectives

   To generate additional income through introduction or expansion of fruit cultivation in upland and mountainous areas in South region

4. Project/Program Description

   The agriculture census data shows that cropping intensity of upland rice is more than 50 % in Xekong and Attapu provinces and shifting cultivation is frequently practiced in those provinces. The assessment of agriculture setting by districts showed that upland and mountainous areas in the two provinces belong to Group 1 and 6. Those groups are characterized by the following.

Table Agriculture Setting in Group 1 and 6

Group	Describe Characteristics	Find Constraints	Clarify Target
G-1	Shifting cultivation is widely practiced on sloping land for production of upland paddy. In order to supplement a lower productivity, non-paddy products (including livestock and home manufacturing products) are produced and marketed to a certain extent. Expansion of irrigation area mainly for lowland paddy production is at mid to low level. Resource management is poor and depletion is high. Farming intensity is at mid to low level, and diversification is at mid to high level.	(1) Domination of unsustainable shifting cultivation which is a cause of reduction of forest cover, soil erosion, etc. (2) Food crops are insufficiently produced. (3) Productivity of non-paddy crops is low, although they are important for cash income source. (4) Production and marketing infrastructure is poorly developed. (5) Degree of market orientation is still at medium level.	(1) To prevent expansion of shifting cultivation, (2) To develop adequate production system for sustainable use of upland. (3) To promote production of cash crops to increase farmers' income both in upland and lowland. (4) To provide production and marketing infrastructure. (5) To improve productivity of lowland paddy.
G-6	Agricultural production is practiced both on sloped land and lowland. Development of irrigation system and access to market are comparatively poor. Since paddy production is insufficient for home consumption, farmers usually diversify into non-paddy products such as fruits and small animals in order to earn cash income. Some degree of soil erosion.	(1) Expansion of shifting cultivation on sloping land. (2) Lower productivity of agricultural products both on sloping land and lowland. (3) Marketing accessibility is generally poor.	(1) To prevent expansion of shifting cultivation. (2) To develop adequate production system for sustainable use of sloping land. (3) To promote production of cash crops to increase farmers' income. (4) To provide production and marketing infrastructure. (5) To improve productivity of lowland paddy.

The above table shows that priority should be given to increasing farm income in the program area to stabilize the shifting cultivation. In this regard, fruit crop cultivation is an attractive alternatives to shifting cultivation from the viewpoints of net crop income.

Moreover, cultivation of fruits tree crops is expected to have positive effect of soil erosion prevention in slope areas.

The proposed project will expand fruit crop cultivation in the upland and mountainous area through extension service including preparation of crop management calendar, and demonstration plots and associated farmer training. The project will be carried out mainly by DAFO staff in the districts concerned with the full technical and administrative support of PAFS and DOA. The training program of DAFO and PAFS staff is an important component of the project. The staff training will be made in the form of on-job training, and study tours to other countries. In addition to the extension service, a participatory approach will be applied to establish a community nursery under the full technical assistance of DAFO staff.

A crop management calendar will be prepared that would include necessary field operations from land preparation to post harvest management. The calendar would fit in with farmers capability and existing agricultural condition of the upland and mountainous area. Moreover, the calendar will be modified from time to time on the basis of field demonstration results. Small and manageable demonstration plots using trial species and/or adaptive technology on crop diversification will be established under the full management or guidance of extension staff of DAFO. The demonstration plots would be centrally located and accessible to farmers. Trial species and/or adaptive technology developed by NAFRI or in other neighboring countries will be applied. The farmers would learn the technical possibilities and financial attractiveness of diversification. For propagation of demonstration plots, training for local extension staff and farmers will be implemented on the basis of "Teach by Showing" or "Learning by Doing".

The nursery preparation of fruit crops is also an important components in the program. The public orientation program will be made to explain how to participate the community managed nursery preparation (CMNP). The initial inputs including seeds/plant materials and fertilizer will be provided to community. The cost of those inputs will be subsidized to some extent. However, the scale of subsidy will be examined carefully considering government policy and subsidy condition of other projects.

Expected technical inputs are: i) overall project management (training and extension), ii) agronomist (fruits crop), iii) post harvest and marketing, iv) community nursery management, v) agro-economist.

In the sixth year of the program, the progress and project impact will be reviewed and the program design will be modified, if necessary. The government will continue the program using its own budget on the basis of recommendations made by the review study. The program is expected to continue till the 10^{th} year at least.

5. Project Components

(1) Technical assistance for overall project management, preparation of crop management calendar, selection, design and establishment of demonstration plots,

(2) Implementation of training program for DOA, PAFS and DAFO staff,

(3) Technical assistance for operation and maintenance of demonstration plots,

(4) Implementation of technical guidance to farmers in the demonstration plots,

(5) Technical assistance for formulation of production groups and marketing, and

(6) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&E) survey.

6. Project Costs

Total project cost is US$ 4,132 thousand consists of US$ 3,829 thousand for phase I and US$ 303 thousand for phase II (local fund only). The detailed is shown below:

Phase I (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	Total
Capital Cost	724	504	380	380	265	257	2,510
Recurrent Cost	153	262	259	259	255	131	1,319
Total	877	766	639	639	520	388	3,829

Phase II (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	Total
Capital Cost	8	8	8	0	24
Recurrent Cost	70	70	70	70	279
Total	78	78	78	70	303

7. Implementing Agency

(1) Department of Agriculture (DOA), Ministry of Agriculture and Forestry

(2) Provincial Agriculture and Forestry Services (PAFSs) in Xekong and Attapu provinces

(3) District Agriculture and Forestry Offices (DAFOs), to be named in the initial stage of the project

8. Organizational and Staffing Requirements

The required number of staff is 69 in total and additional staff will not be required.. The details are shown below:

	Required Staff
1. DOA	3
2. Staff in Province	6
3. DAFO Project Staff	60
Total	69

9. Implementation Schedule

The program will be implemented over 10 years consisting of 6 years for donor-assisted period and 4 years for national owned budget period according to the following schedule.

Phase I: Donor assisted (1st-6th year)

(1) 1st Year: Preparatory period for planning, implementation of agricultural

needs assessment and baseline survey, preparation of draft crop management calendar, implementation of training program to staff

(2) 2nd Year — Establishment of demonstration plots (10 plots), implementation of training program to staff and farmers

(3) 3rd - 5th year: — Establishment of demonstration plots (15 plots x 2 years + 20 plots x 1 years = 60 plots), implementation of training program to staff and farmers, establishment of community managed nursery preparation (CMNP), implementation of M&E survey

(4) 6th year: — Implementation of training program to staff and farmers, establishment of community managed nursery preparation (CMNP), implementation of M&E survey and review of the project

Phase II: local fund (7th-10th year)

(6) 7th - 10th year: — Establishment of demonstration plots (20 plots x 3 years = 60 plots), implementation of training program to staff and farmers, further establishment of community managed nursery preparation (CMNP), implementation of M&E survey

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training leave the project for appointment of new jobs in the private sector. Trainee would need to enter into a bond prior to commencing training agreeing to serve in public sector for a specified period following completion of training.

11. Expected Benefit

(1) The cultivated area of value added crops in suburban area would be expanded

(2) As result of (1), income of farmers is enhanced.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counterpart budget for operation and maintenance cost of the project

(2) Leaving of trained staff for new assignment or new jobs

13. Assessment of Natural and Social Environment

(1) Natural environment: Agro-chemicals and chemical fertilizer should be applied properly according to the technical guidance.

(2) Social environment: No impacts are expected.

14. Special Arrangements

Demarcation of areas with projects for stabilization of shifting cultivation should be confirmed and considered prior to implementation of the project.

Project No. AC-10

1. Title of Project/Program

   Sericulture Development Project

2. Location

   Sericulture Research and Extension Center (SREC) located in Vientiane Municipality, and Nationwide

3. Objectives

   To generate additional income in rural area through expansion of production of qualified cocoon and raw silk materials

4. Project/Program Description

   There are no official data available relating to cocoon and silk production on a national basis. In fact, most rural households have carried out weaving activities on subsistence basis rather than commercial basis. From the late 1980s, weaving workshops have been established in the rural area and their products have been sold to urban markets or sometimes international markets. In silk weaving, most silk yarns as the materials of silk weaving are imported from other countries; i.e. China, Thailand and Vietnam, though sericulture is a traditional industry of Lao PDR. This is due to the low quality and limited quantity of domestic production of silk yarn, since sericulture activities have been made based on local variety of silkworm, traditional rearing, and non-modernized reeling.

   Through field observation and interviews with officers concerned with sericulture, 11 provinces and 164 villages are currently engaged in sericulture as shown below:

Table Present Sericulture Activity in Lao PDR

Municipality/Province	No of Sericulture Village (Estimation)	Remarks
1. Vientiane Municipality	2	These villages start sericulture 3 years ago
2. Vientiane Province	1	Two private companies carry out.
3. Louangnamtha Province	30	-
4. Oudomxai Province	5	Not active
5. Xainabury Province	10	-
6. Luangprabang Province	1	Not active
7. Houaphan Province	20	-
8. Xiengkhuang Province	40	One private company carries out sericulture
9. Borikhamxai Province	20	Sericulture is made mainly in Lak Sao district.
10. Savannakhet Province	30	-
11. Champasak Province	5	Not active
Total	164	

Source: Village number is estimated based on interviews to officers concerned to sericulture.

The present constraints and potentials in the sericulture are summarized below:

(1) Most of sericulture farms are under traditional system resulting in low quality and productivity of cocoon and silk yarn.

(2) Most sericulture farms have to use the local variety of silkworm due to shortage of information and poor accessibility to improved varieties, although Sericulture

Research and Extension Center can provide the egg of improved silkworm variety.

(3) The SREC was established in 1970. JICA technical assistance to the SREC has been made since early 1970. However, the function of the SREC was suspended completely during the 1975-1985 period due to political confusion in Lao PDR. During this period, the constructed facilities and installed equipment under JICA grant aid assistance deteriorated and many trained staff left the Center. The rehabilitation of those facilities and equipment is required so as to supply more qualified silkworm eggs and carry out training program for of a greater number of farmers. Staff training is also highly required.

(4) Silk yarn production, as a domestic activity needs to be promoted to enable substitution for imported commodities.

(5) From a viewpoints of income generation in shifting cultivation areas, sericulture is an important measure to stabilize shifting cultivation.

The proposed project will expand both cocoon and silk yarn production through the supply of qualified silkworm eggs and extension service for introduction of modernized rearing and reeling technologies. The project will be carried out mainly in existing Sericulture Research and Extension Center (SREC), located in Vientiane Municipality, under municipal government. In the initial stages of the project, grainage, rearing facility and the dormitory for trainees will be rehabilitated in SREC compound.

The training program of SREC staff and farmers is also an important component of the project. The staff training will be made in the form of on-job training, study tour, and scholarship to universities or research institutes in other countries. Training to farmers will also be made in the form of training program in SREC, study tour, and field guidance made by SREC staff.

For implementation of the project at farmers' level, the selection of priority sericulture promotion area will be made on village basis using appropriate criteria; i.e. present sericulture activity, land availability, willingness of village people, access to market etc. Awareness campaign and public orientation should be considered to motivate community participation to the project.

For sericulture activities, farmers require initial and operation funds including construction of mulberry plantation and rearing house, rearing and reeling equipment, consumables and silkworm eggs. Therefore, village revolving funds should be established under the full assistance of local NGOs to the project. The Project will create those funds at the village level and NGOs under the project will then train beneficiaries on how to maintain them. NGOs will also carry out monitoring activities of village revolving funds. In addition to those funds, farmers will form groups under the technical assistance of NGOs. The groups are expected to carry out cooperative maintenance of mulberry plantation, silkworm rearing and marketing to enhance sustainability of project activity. In parallel with fund creation and group formulation, the technical guidance will be made step by step; i.e. i) establishment of mulberry plantation and silkworm rearing house, ii) maintenance of those facilities, iii) silkworm rearing, iv) post cocoon activities including

reeling and marketing.

In this context, expected technical inputs are: i) overall project management (training and extension), ii) engineer for rehabilitation of SREC, iii) mulberry plantation, iv) silkworm rearing including egg production, iv) participatory development for village revolving funds, v) marketing (cocoon, silk yarn and weaving), vi) post cocoon including silk yarn reeling.

5. Project Components

(1) Technical assistance for overall project management, mulberry plantation, silkworm rearing, participatory development for village revolving funds, post cocoon, and marketing,

(2) Technical assistance for rehabilitation plan of equipment and stations, upgrading egg production technology, design, cost estimation as well as preparation of tender document,

(3) Rehabilitation of SREC and installation of necessary equipment,

(4) Selection of priority villages for implementation of the project,

(5) Establishment of village revolving funds and formulation of farmers groups under the technical assistance of local NGOs,

(6) Implementation of training program for staff and farmers, and

(7) Implementation of technical guidance to sericulture farms in terms of establishment of mulberry plantation and silkworm rearing house, maintenance of those facilities, silkworm rearing, post cocoon activities.

6. Project Costs

Total project cost is US$ 13,869 thousand consists of US$ 6,803 thousand for phase I and US$ 7,066 thousand for phase II. The detailed is shown below:

Phase I (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	528	1,828	693	628	578	4,255
Recurrent Cost	311	438	701	699	401	2,548
Total	839	2,266	1,394	1,327	979	6,803

Phase II (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	622	1,272	822	572	422	3,710
Recurrent Cost	853	872	859	481	291	3,356
Total	1,475	2,144	1,681	1,053	713	7,066

7. Implementing Agency

Sericulture Research and Extension Center (SREC), Vientiane municipality

8. Organizational and Staffing Requirements

The required number of staff is 81 in total. In the SREC, 11 additional staff will be required. At DAFO level, 10 staff and 50 staff will be required in phase I and phase II, respectively. However, additional staff at DAFO level will not be recruited and existing DAFO staff will be trained for implementation of the project. The details are shown below:

	Present Staff	Proposed Staff	Balance
1. SREC (Project Director)	1	1	0
2. Staff in SREC	9	20	11
3. DAFO Project Staff	-	60 (10+50)	60
Total	10	81	71

Note: For project staff of DAFO, 10 staff and 50 staff are required in phase I and II, representatively.

9. Implementation Schedule

The project will be implemented in 10 years, consisting of 5 years for phase I and 5 years for phase II, according to the following schedule.

Phase I

(1) 1st Year: Preparatory period for planning

(2) 2nd Year Rehabilitation of SREC facility and procurement of necessary equipment, technical assistance and training in SREC, implementation of pilot sericulture schemes (10 villages) using NGOs

(3) 3rd - 5th year: Technical assistance and training program in SREC, implementation of pilot sericulture schemes (30 villages) using NGOs

(4) 5th year: Mid-term review and re-planning of the project

Phase II

(1) 1st Year: Rehabilitation of reeling facility and procurement of necessary equipment, technical assistance and training in SREC, implementation of pilot sericulture schemes (50 villages) using NGOs

(3) 2rd - 3rd year: Technical assistance and training program in SREC, implementation of pilot sericulture schemes (100 villages) using NGOs

(4) 4th - 5th year: Follow-up period and final evaluation

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training leave the project for appointment of new jobs in the private sector. Trainees would need to enter

into a bond prior to commencing training agreeing to serve in public sector for a specified period following completion of training.

11. Expected Benefit

    (1) Cocoon and silk yarn productivity will be enhanced through introduction of improved varieties of silkworm and modern technologies.

    (2) As result of the above, income of sericulture farms will be enhanced and sericulture is expected to be a major alternative income source in the rural area.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    (1) Shortage of government counterpart budget for operation and maintenance cost of SREC.

    (2) Trained staff leaving SREC for new assignment or new jobs.

13. Assessment of Natural and Social Environment

    (1) Natural environment: No impacts are expected.

    (2) Social environment: Most sericulture activity is undertaken by women and some ethnic groups. Gender and ethnic issue should be assessed carefully in the planning stage.

14. Special Arrangements

    The SREC is under the Vientiane municipality, not the central government, while the project will have nationwide coverage. Therefore, it is considered that SREC should be placed under the central government in the initial stage of the project.

Project No. AC-12

1. Title of Project/Program

   Farming Technology Dissemination Project

2. Location

   Nationwide

3. Objectives

   To provide farmers and extension workers with improved farming technology information through radio and TV programs

4. Project/Program Description

   Agriculture extension does not function well in Lao PDR, since the provision of extension staff has not been completed yet at any levels, i.e. MAF, province and district. In addition, the lack of equipment and shortage of operational funds for extension fieldwork are serious problems. On the other hand, farmers need various agriculture and improved farming technology information to enhance their agriculture productivity and farm income, since most farmers know only the traditional way. Further, the adult literacy rate is still under 60% in Lao PDR and around 40 % of villages have no road access. In this regard, even if extension materials for various agricultural information are available, it is very difficult for farmers to receive or read such extension materials.

   To overcome the above constraints in the extension service, the proposed project will include: i) development of extension materials based on the past experience of various projects as well as best farming practices in Lao PDR and other countries, ii) providing information of extension materials to farmers and extension staff through mass media, especially radio and TV.

   At present, there is a wealth of knowledge about agricultural practices for various farming systems. This covers: annual crops, particularly rice (both lowland and upland, irrigated and rainfed); perennial crops; livestock and fish rearing; mixed farming; cropping patterns; stabilization of shifting cultivation; domestication of non-timber forest products; horticulture; composting, mulching and organic fertilizers; application of inorganic fertilizers; integrated pest management; use of pesticides and herbicides etc.

   The proposed project will collect all existing relevant information, both from within the country and from the SE Asia region, and this information will be examined under the technical assistance of experienced experts for farming system or in various agricultural specialties. Field tests could be carried out under the research centers connected to NAFRI, if necessary. The project will compile a series of extension materials detailing locally adaptive, economically justifiable, and environmentally friendly farming practices for different farming systems in the various agro-climatic zones. The project will continually update information and provide revised and new data in a timely fashion.

   Radio and television programs are an effective means of providing information, since the

adult literacy rate is still low and accessibility of village is very low in Lao PDR. All the extension materials would be processed for the broadcast media. Based on the processed materials, the project will develop radio and television program for broadcasting technical information on farming system. The above materials will be published in various forms too, including leaflets, posters, newsletter, or newspaper, and made available to all interested parties, especially farmers, extension workers and subject matter specialists.

Marketing intelligence system is also proposed as one of the projects in market sub-sector. The marketing information and broadcasting program developed in that marketing intelligence system project will be finally combined to the proposed project.

The expected technical inputs for technical assistance are: i) overall project management (extension methodology); ii) extension materials development; iii) broadcast; iv) agricultural technology, v) short term appointment of experts in various agricultural specialties.

5. Project Components

The project's components are summarized below.

(1) Technical assistance for collection of information/data about farming systems, screening of the information/data, technical advice to undertake a field test.

(2) Technical assistance for preparation of materials, and processing those materials for broadcast media, and development of TV and radio programs for agriculture information, preparation of materials in various written forms.

(3) Installation of equipment for TV and radio program.

(4) Implementation of TV and radio program and publishing extension materials.

(5) Update and amend programs and publications in the light of new information or feedback from the field.

(6) Monitor and evaluate the publications' effectiveness and modify if necessary.

6. Project Costs

Total project cost is US$ 2,704 thousand. The detailed is shown below:

(Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	276	376	376	276	276	1,580
Recurrent Cost	63	215	318	315	212	1,124
Total	339	591	694	591	488	2,704

7. Implementing Agency

The proposed project will be implemented under the full responsibility of the Agriculture Extension Agency (AEA) in DOA in Vientiane, but it will work closely with the Information, Management, Policy and Strategy Planning Division (IMPSPD) and other research centers in NAFRI as well as the Division of Propaganda and Promotion (DPP) in

the Science Technology and Environmental Agency (STEA) in the Prime Ministers Office. The mandate of each organization is as follows:

	Collection of Data	Examination of Information	Compilation of Materials	Broad Casting Program
AEA of DOA	O	X	O	O
IMPSPD of NAFRI	O	X	O	X
Research Centers of NAFRI	O	O	X	X
STEA	O	O	X	X

Note: O; work to be undertaken, X; work not applicable.

8. Organizational and Staffing Requirements

This program will be implemented under the present organizational framework. An assessment of staff requirements should be undertaken, but it is envisaged that three additional staff will be needed (2 for IMPSPD and 1 for DPP).

Vientiane Municipality	Present Staff No.	Proposed Staff No.	Balance
AEA	5 (25 in total)	5	0
NAFRI (IMPSPD)	3	5	+ 2
STEA (DPP)	2	3	+ 1
Total	10	13	+ 3

9. Implementation Schedule

The project will be implemented over 5 years according to the following schedule.

(1) 1st Year: Preparatory period for planning and collection of information.

(2) 2nd Year Collection and examination of information, development of extension materials, development of mass media program,

(3) 3rd and 4th year: Collection and examination of information, development of extension materials, implementation of mass media program, publishing materials/information.

(4) 5th year: Updating and amending publications of extension materials, implementation of monitoring and evaluation program.

10. Lessons Learnt and How Incorporated into Proposed Project

It is sometimes difficult to collect information and data from other agencies due to sectionalism amongst ministries or departments. The Lao government should endorse and encourage the collection of data from concerned agencies.

11. Expected Benefit

(1) Farmers and extension workers are sure to receive various agricultural information.

(2) As a result of (1), agriculture productivity will be enhanced, and better and more sustainable use of resources will made.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    (1) Shortage of trained staff due to other commitments.

    (2) Shortage of government counterpart budget to meet operation and maintenance costs of the project implementation.

13. Assessment of Natural and Social Environment

    (1) Natural environment. There should be positive impacts through proper and appropriate land use.

    (2) Socio-economic conditions. There should be a positive impact because farmers improve their yields and income generating activities.

14. Special Arrangements

    None

Project No. AC-14

1. Title of Project/Program

   Coffee Cultivation Technology Research Program

2. Location

   Ban Itou Coffee Research Center (CRC) located in Champasak province, and Bolovens Plateau

3. Objectives

   To develop modern technology for coffee cultivation to contribute to exports.

4. Project/Program Description

   Coffee is cultivated mainly in Bolovens plateau on a commercial basis. The harvested area, yield and production of coffee from 1996 to 2000 are summarized in the table below:

Harvested Area, Yield and Production of Coffee on Average from 1996 to 2000

Crops	Harvested Area		Yield		Production	
	Average	Annual Growth	Average	Annual Growth	Average	Annual Growth
	('000 ha)	(%)	(ton/ha)	(%)	('000 ton)	(%)
Coffee	26.8	7.8	0.6	13.4	16.1	22.3

Source: Agriculture Statistics, 2000, DOP, MAF

The annual production of cofee increased rapidly by 22.3% p.a. due to expansion of harvested area and increase of unit yield. Assistance provided by Groupe Agence Francaise de Development (AFD) has caused these improvements of coffee cultivation in Bolovens plateau. Out of 15,000 tons of total produced coffee in Champasak province, 14,300 tons of coffee was exported to the European and Singapore markets in 1999. However, the coffee cultivation in Bolovens plateau faces the following constraints for further expansion.

(1) The export price of Boloven coffee is 10 % lower than the international market price due to poor quality. Low quality is mainly caused by poor husbandry, early harvesting and manual harvest processing from screening to drying. Most of farmers and middlemen have limited concern to quality improvement, since there is no price system based for quality. The price is fixed on the basis of weight only.

(2) The coffee farms are very sensitive to market price fluctuations since coffee is cultivated in the form of mono-culture. Therefore, the recent low price of international market price directly affects to the coffee farm economy.

The proposed project would develop adaptive research technology at the field level, especially for quality improvement and crop diversification. The main feature of the proposed project is envisaged as follows:

(1) A draft quality standard of coffee products will be established and applied in

Bolovens plateau. To achieve this, international trade standards, examples of quality standards from other countries and the actual situation of the Bolovens plateau will be examined.. The Lao government intends to expand organic cultivation, since natural coffee under organic cultivation fetches a higher price in the Europeanmarket. The effect of organic cultivation will be considered in developing the quality standard.

(2) The project will develop adaptive research technology at the field level, especially for quality improvement and crop diversification as well as mix culture with livestock and inland fishery. These recommended technologies would be tested in the field carefully from technical and economical viewpoints and would then be provided as technical packages through extension.

(3) A quality testing unit will be set up in Ban Itou Coffee Research Center (CRC). Most of the staff have very limited knowledge and experience and accordingly, the training program for staff in the unit is a very important component of the project. The training will be in the form of on-job training, study tour, and overseas training. In addition to these human resource developments, installation of quality testing equipment should be made in the quality testing unit.

(4) The training program of extension staff of PAFS and DAFO as well as model coffee farmers will be implemented in Ban Itou Coffee Research Center. The training program includes; i) importance of quality control of coffee, ii) improved coffee cultivation technology including post-harvest activities for quality improvement, and iii) crop diversification technology. After the training program, the campaign on quali will be made with the full cooperation of extension staff of PAFS and DAFO. In parallel, demonstration plots will be established amongst existing farms to demonstrate improvement of the coffee quality and farm income.

(5) The coffee market information including grade and quality, seasonal price trends by major production areas, price trends in major markets and at borders, export volume trend will be monitored and analyzed. The analyzed result will be fed back for further improvement of grade system and cultivation technology of coffee.

Proposed research area in the project will be as follows:

(1) Overall research management including planning, and monitoring & evaluation,

(2) Post harvest and quality control,

(3) Agronomy and soil fertility management,

(4) Farming system and economy,

(5) Extension and training, and

(6) Short term experts in various agricultural specialties.

5. Project Components

(1) Technical assistance for implementation of research at CRC as well as experiments

field in terms of the above research area,

(2) Technical assistance for establishment of a coffee quality standard, installation of equipment for quality test, and implementation of quality test,

(3) Implementation of staff training program including on the job training and study tour,

(4) Technical assistance for training program for extension staff of PAFS and DAFO as well as model coffee farmers, and

(5) Technical assistance for implementation of extension activities, establishment of demonstration plots, and monitoring and evaluation of coffee market information.

6. Project Costs

Total project cost is US$ 4,724 thousand. The detailed is shown below:

(Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	668	1,528	416	408	408	3,428
Recurrent Cost	253	280	255	254	254	1,296
Total	921	1,808	671	662	662	4,724

7. Implementing Agency

Ban Ito Coffee Research Center, National Agriculture and Forestry Research Institute (NAFRI), MAF

In association with

(1) Provincial Agriculture and Forestry Service (PAFS) in Champasak, Saravan and Xekong provinces

(2) District Agriculture and Forestry Offices (DAFOs) located in Bolovens plateau.

8. Organizational and Staffing Requirements

The quality testing unit for crop products grade will be established under CRC. The required number of staff is 36 staff for project implementation. Out of 36 staff, an additional 10 staff will be required. The details are shown below:

	Preparatory Period	Implementation Period of Pilot Project
2. Staff of Inspection Unit	5	10
2. Staff in Province	-	6
3. DAFO Project Staff	-	20
Total	5	36

9. Implementation Schedule

The project will be implemented over 5 years according to the following schedule.

(1) 1st Year: Preparatory period for planning, design of quality testing unit and establishment of coffee quality standard

(2) 2nd Year Establishment of quality testing unit, implementation of training program to staff

(3) 3rd - 5th year: Implementation of training program to PAFS staff, DAFO staff and model farmers, establishment of demonstration plots, implementation of M&E survey

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training program leave the project for appointment to new jobs in the private sector. Trainees would have to enter into a bond prior to commencing training program agreeing to serve in public sector for a specified period following completion of training.

11. Expected Benefit

(1) The quality of crop products will be improved and quality based price system will be established.

(2) Crop diversification and production of livestock and fishery in coffee cultivated area will be expanded.

(3) As result of the above, the income of farmers will be enhanced or stabilized.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counter budget for operation and maintenance cost of research center and stations.

(2) Trained staff leaving the CRC for assignment of new position or new jobs.

13. Assessment of Natural and Social Environment

(1) Natural environment: Agro-chemicals and chemical fertilizer should be applied properly according to the technical guidance.

(2) Social environment: No impacts are expected.

14. Special Arrangements

None.

Project No. AC-15

1. Title of Project/Program

   Vegetable Cultivation Technology Research Program

2. Location

   Horticulture and Vegetable Research Center (HVRC) located in Vientiane Municipality, and Nationwide

3. Objectives

   To select new improved varieties and develop adaptive technologies at the field level for vegetable cultivation.

4. Project/Program Description

   Vegetables are cultivated mainly in proximity to large urban centers on commercial basis. In addition, Xayabury and Champasack provinces produce vegetables for export to Thailand. In the other rural areas, vegetable production is cultivated mainly in home gardens for consumption. The harvested area, yield and production of vegetables from 1996 to 2000 are summarized in the table below:

Harvested Area, Yield and Production of Vegetables on Average from 1996 to 2000

Crops	Harvested Area		Yield		Production	
	Average	Annual Growth	Average	Annual Growth	Average	Annual Growth
	('000 ha)	(%)	(ton/ha)	(%)	('000 ton)	(%)
Vegetables	43.5	61.7	5.1	-1.4	235.6	59.4

Source: Agriculture Statistics, 2000, DOP, MAF

The annual production of vegetables increased rapidly by 59.4% p.a. due to expansion of harvested area. On the other hand, the average yield has declined slightly by 1.4%. Though commercial vegetable production for export has been underway for only a short time, research activity for vegetable production is relatively weak and has lagged behind due to limited technical and financial resources. It is also noted that the research facilities and technical level of staff are very limited in the research field of vegetable cultivation.

The proposed project would select recommended varieties and develop adaptive research technology at the field level. These recommended varieties and technology would be provided as technical packages through extension service on an area basis. The project will be carried out in Horticulture and Vegetable Research Center (HVRC), located in Vientiane Municipality, under National Agriculture and Forest Research Institute (NAFRI). In addition to HVRC, it is required to implement trial experiments in provincial stations or in farmers' fields to develop adaptive research technology relevant to specific areas. Adaptive research trials using methods from neighboring countries with similar agronomic conditions would also be tested.

The training program of staff in HVRC and other staff in the provinces are also important subjects in the project. The training will be made in the form of on-job training, study tour, and scholarship to universities or research institutes in other countries. In addition to these

human resource developments, improvement of facilities and equipment should be made in HVRC. Necessary arrangement for research stations and experiment field should be also considered in the proposed project.

Proposed research area in the project will be as follows:

(1) Overall research management including planning, and monitoring & evaluation,

(2) Variety improvement and trial,

(3) Agronomy and soil fertility management,

(4) Plant protection, and

(5) Farming system and economy.

5. Project Components

(1) Technical assistance for implementation of research at HVRC and provincial stations as well as experiment field in terms of the above research area,

(2) Technical assistance on future plan of vegetable research and development, rehabilitation and upgrading plan, design, cost estimation as well as preparation of tender document,

(3) Adaptive research trials, demonstration plots and field testing,

(4) Rehabilitation of existing HVRC facilities, upgrading of research stations at provincial level, and

(5) Implementation of key researcher training including on the job training and oversea training.

6. Project Costs

Total project cost is US$ 7,205 thousand consists. The detailed is shown below:

(Unit: Million US$)

Cost Item	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Total
Capital Cost	921	821	281	281	1,781	281	281	281	281	281	5,490
Recurrent Cost	188	179	163	163	208	163	163	163	163	163	1,715
Total	1,109	1,000	444	444	1,989	444	444	444	444	444	7,205

7. Implementing Agency

The Horticulture and Vegetable Research Center (HVRC), NAFRI, Ministry of Agriculture and Forestry

8. Organizational and Staffing Requirements

The required number of staff is 33 in total and 23 additional staff will be required. Out of 23 additional staff for the implementation of program, 3 will be recruited newly and 20 will be appointed from existing PAFS or DAFO staff. The details are shown below:

	Present Staff	Proposed Staff	Balance
1. HVRC (Project Director)	1	1	0
2. Researchers in HVRC	9	12	3
3. Researchers in Stations or Experimental Field	-	20	20
Total	10	33	23

9. Implementation Schedule

The project will be implemented in 10 years according to the following schedule.

(1) 1st Year: Preparatory period for planning and design of rehabilitation

(2) 2nd Year Rehabilitation, technical assistance and training in HVRC

(3) 3rd and 5th year: Technical assistance and training program in HVRC

(4) 5th year: Mid term review and re-planning of the project, upgrading of stations, technical assistance and training program in HVRC

(5) 6th and 8th year: Technical assistance and training program in HVRC and stations

(6) 9th and 10th year: Follow-up period and final evaluation

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training program leave the project for appointment to new jobs in the private sector. Trainees would have to enter into a bond prior to commencing training program agreeing to serve in public sector for a specified period following completion of training.

11. Expected Benefit

(1) The adaptive varieties and technologies for vegetables are developed

(2) Vegetable productivity will enhance through using adaptive varieties and technologies.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counterpart budget for operation and maintenance cost of research center and stations.

(2) Trained staff leaving the HVRC for assignment of private sector.

13. Assessment of Natural and Social Environment

(1) Natural environment: Small negative impacts are expected in the rehabilitation of HVRC or upgrading of stations.

(2) Social environment: No impacts are expected.

14. Special Arrangements

None.

Project No. AC-16

1. Title of Project/Program

   Fruits Cultivation Technology Research Program

2. Location

   Horticulture and Vegetable Research Center (HVRC) located in Vientiane Municipality, and Nationwide

3. Objectives

   To select new improved fruit varieties and develop adaptive cultivation technologies at the field level

4. Project/Program Description

   Agriculture statistics do not provide any data on fruits production. The FAO/WB Study (1999) noted that further potential exists to increase production of various fruits, since the climate Lao PDR allows the cultivation of various varieties of tropical, sub-tropical and temperate fruits. According to the pre-final market study made by JICA (2000), 224 tons of fruits were imported from Thailand mainly to Vientiane Municipality in 1999/2000. Major imported fruits are; durian, apple, grape, longan, lychee, mandarin, mangosteen, orange, pummelo, rambutan etc. Apart from apples, these imported fruits can be produced in Lao PDR. In addition, mango is one type of fruit with a comparative advantage, and DOA intends to promote it for export. Considering above situation, a research program is required to select appropriate varieties and develop fundamental technology.

   Although fruits production shows high potential, the research activity in this field is relatively weak and has lagged behind due to limited technical or financial resources. It is also noted that the research facilities and technical level of staff are also very limited.

   The proposed project will select recommended varieties and develop adaptive research technology at the field level. These recommended varieties and technology would be provided as technical packages through extension service on an area basis. The project will be carried out in Horticulture and Vegetable Research Center (HVRC), located in Vientiane Municipality, under the National Agriculture and Forest Research Institute (NAFRI). In addition to HVRC, it is required to implement trial experiments in provincial stations or farmers field to develop adaptive research technology at area basis. Adaptive research trials using methods from neighboring countries with similar agronomic conditions would also be tested.

   The training program of staff in HVRC and other staff in the province are important parts of the project. The training will be made in the form of on-job training, study tour, and scholarship to universities or research institutes in other countries. In addition to these human resource developments, improvement of facilities and equipment should be made in HVRC. Necessary arrangements for research stations and field experiments should also be considered in the proposed project.

Proposed research activities in the project will be as follows:

(1) Overall research management including planning, monitoring & evaluation,

(2) Selection of crop/varieties and trials,

(3) Agronomy and soil fertility management including soil erosion control,

(4) Plant protection, and

(5) Farming system and agro-economy including marketing.

5. Project Components

(1) Technical assistance for implementation of research at HVRC, provincial stations, and field experiments in terms of the above research area,

(2) Technical assistance on future plan of fruits research and development, rehabilitation and upgrading plan, design, cost estimation as well as preparation of tender document,

(3) Adaptive research trials, demonstration plots and field testing,

(4) Rehabilitation of existing HVRC facilities, upgrading of research stations at provincial level, and

(5) Implementation of key researcher training including on the job training and overseas training.

6. Project Costs

Total project cost is US$ 7,205 thousand consists. The detailed is shown below:

(Unit: Million US$)

Cost Item	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Total
Capital Cost	921	821	281	281	1,781	281	281	281	281	281	5,490
Recurrent Cost	188	179	163	163	208	163	163	163	163	163	1,715
Total	1,109	1,000	444	444	1,989	444	444	444	444	444	7,205

7. Implementing Agency

The Horticulture and Vegetable Research Center (HVRC), NAFRI, Ministry of Agriculture and Forestry

8. Organizational and Staffing Requirements

The required number of staff is 33 in total and 23 additional staff will be required. Out of the 23 additional staff, 3 will be recruited and 20 will be appointed from existing PAFS or DAFO staff. The details are shown below:

	Present Staff	Proposed Staff	Balance
1. HVRC (Project Director)	1	1	0
2. Researchers in HVRC	9	12	3
3. Researchers in Stations or Experimental Field	0	20	20
Total	10	33	23

9. Implementation Schedule

The project will be implemented in 10 years according to the following schedule.

(1) 1st Year: Preparatory period for planning and design of rehabilitation

(2) 2nd Year Rehabilitation, technical assistance and training in HVRC

(3) 3rd and 5th year: Technical assistance and training program in HVRC

(4) 5th year: Mid-term review and re-planning of the project, upgrading of stations, technical assistance and training program in HVRC

(5) 6th and 8th year: Technical assistance and training program in HVRC and stations

(6) 9th and 10th year: Follow-up period and final evaluation

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training program leave the project for appointment to new jobs in the private sector. Trainees would have to enter into a bond prior to commencing training program agreeing to serve in public sector for a specified period following completion of training.

11. Expected Benefit

(1) The adaptive varieties and technologies for fruit cultivation are developed

(2) Fruit crop productivity will be enhanced through using the most suitable varieties and technologies.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counterpart budget for operation and maintenance cost of research center and stations.

(2) Leaving of trained staff for assignment in private sector.

13. Assessment of Natural and Social Environment

(1) Natural environment: Small negative impacts are expected in the rehabilitation of HVRC or upgrading of stations.

(2) Social environment: No impacts are expected.

14. Special Arrangements

None.

Project No. AC-21

1. Title of Project/Program

   Basic Seed Production Technology Development Project

2. Location

   Agriculture Research Center (ARC) located in Vientiane Municipality, in association with Napok Seed Multiplication Center located in Vientiane Municipality

3. Objectives

   To develop the basic seed production technology including breeding and variety evaluation, breeders' seed production, foundation seed production for cereal crops and beans.

4. Project/Program Description

   At present, no basic seed production system has been developed in Lao PDR.except for rice. Therefore, most seeds for cereal crops and beans are imported from Thailand or other countries and so are are expensive. This is one of the bottlenecks to the expansion of crop diversification in present mono-paddy based cultivation.

   On the other hand, experiences in other countries show that government organization is not very efficient seed production agencies. There is concern for limited return on investment and high cost in the government organization. Therefore, the seed production made by public sector should be limited to the initiative function for private sector. In this regard, the breeding of improved variety, production of breeders' seeds and foundation seeds that are not available in the private sector could be government responsibility. The production of certified seeds will be made on the contract basis with farmers.

   The proposed project will include breeding and variety evaluation, seed certification, development of breeders' seeds, production of foundation seeds. In addition to basic (breeders' and foundation seed) seed development, the contract farmers system for production of registered seeds will be expanded in subsequent phase, since intervention of the public sector and public investment should be minimized. Considering farmers' needs and technical aspects, candidate crops for the proposed project will be selected.

   The breeding and variety evaluation and development of breeders' seeds will be implemented in the Agriculture Research Center (ARC) of the National Agriculture and Forest Research Institute (NAFRI).. It is also proposed to implement the foundation seed production on a trial basis for technical improvement of staff in Napok Seed Multiplication Center under the Department of Agriculture (DOA).

   Following the above developments, the production system of certified seeds will be established in phase II, subject to the successful implementation of phase I. The majority of certified seed production will be done on a contract basis with farmers.

   The training program of staff in ARC and Napok Seed Multiplication Center under Department of Agriculture is also an important component in the project. The training will be made in the form of on-job training, study tour, and scholarship to universities or

research institutes in other countries. In addition to these human resource developments, installation or upgrading of some equipment should be made in ARC and Napok Seed Multiplication Center in the initial stage of the project.

The expected technical inputs for technical assistance are: i) overall project management; ii) breeding (cereal crop); iii) breeding (others); iv) seed production management.

5. Project Components

(1) Technical assistance on seed development plan, upgrading plan of equipment and cost estimation,

(2) Technical assistance for variety evaluation, breeders' seed production and foundation seed production,

(3) Installation of new equipment for variety evaluation breeders' seed production and foundation seed production,

(4) Technical assistance for staff training including on the job training and oversea training,

(5) Technical assistance for establishment of seed multiplication system (Phase II), and

(6) Technical assistance for training to contract farmers in the seed multiplication center and farmers field (Phase II).

6. Project Costs

Total project cost is US$ 5,796 thousand consisting of US$ 3,447 thousand for phase I and US$ 2,348 thousand for phase II. The detailed is shown below:

Phase I (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	848	348	348	348	348	2,240
Recurrent Cost	259	237	237	237	237	1,207
Total	1,107	585	585	585	585	3,447

Phase II (Unit: Thousand US$)

Cost Item	1st Year	2nd Year	3rd Year	Total
Capital Cost	410	410	410	1,230
Recurrent Cost	373	373	373	1,118
Total	783	783	783	2,348

7. Implementing Agency

For Phase I

The National Agriculture and Forestry Research Institute (NAFRI), Ministry of Agriculture and Forestry

For Phase II

The Department of Agriculture (DOA), Ministry of Agriculture and Forestry

8. Organizational and Staffing Requirements

Breeding of improved variety, production of breeders' seeds will be made under ARC and production of foundation seeds will be made under Napok Seed Multiplication Center. Close coordination between above centers will be required.

This program will be implemented under the existing ARC and Napok Seed Multiplication Center and additional staff will not be required.

	Key Counterpart
1. Phase I	10
2. Phase II	15
Total	25

9. Implementation Schedule

The project will be implemented as follows:

(1) Phase I: 5 Years in total

First Year	Preparatory period for planning and installation of equipment
Second to Forth Year	Implementation of technical assistance & training
Fifth Year	Mid term review and re-planning of the project, implementation of technical assistance & training

(2) Phase II: 3 Years

First Year	Preparatory period for planning and implementation of technical assistance & training
Second Year	Implementation of technical assistance & training
Third Year	Final evaluation and implementation of technical assistance & training

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed that Napok Seed Multiplication Center cannot maintain existing processing machines properly due to lack of funds for operation & maintenance (O&M). Therefore, the fund will be established using income from selling breeders' seeds and improved seeds and the entire O&M cost and staff allowance should be maintained from this fund.

11. Expected Benefit

(1) The basic seed production technology including breeding and variety evaluation, breeders' seed production, foundation seed production for cereal crops and beans will be developed.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Shortage of government counterpart budget for operation and maintenance cost of ARC and Napok Seed Multiplication Center.

(2) Leaving of trained staff from ARC and Napok Seed Multiplication Center for assignment of new position or new jobs.

13. Assessment of Natural and Social Environment

    (1) Natural environment: No impacts are expected.

    (2) Social environment: No impacts are expected.

14. Special Arrangements

    None.

Project No. AC-22

1. Title of Project/Program

   Upland Crop Cultivation Technology Research Program

2. Location

   Agriculture Research Center (ARC) located in Vientiane Municipality, and Nationwide

3. Objectives

   To select new improved varieties and develop adaptive technologies at field level for upland crop cultivation.

4. Project/Program Description

   As mentioned in the Government's Strategic Vision for the Agriculture Sector, the approach to commercial agriculture in flatland is to improve and diversify farming systems with increased and intensified cash crops, and livestock and fishery production. In the sloping land, on the other hand, farming systems diversification and agro-forestry should be developed through adaptive research, trials and demonstrations on farmers' field. It is, therefore, understood that the most important step for commercial agriculture is to promote crop diversification for both flatland and sloping land. In this regard, upland crop technology should be developed to expand the production area of alternative crops.

   The harvested area, yield and production of major upland crops from 1996 to 2000 are summarized in the table below:

Harvested Area, Yield and Production of Major Upland Crops on Average from 1996 to 2000

Crops	Harvested Area		Yield		Production	
	Average	Annual Growth	Average	Annual Growth	Average	Annual Growth
	('000 ha)	(%)	(ton/ha)	(%)	('000 ton)	(%)
Maize	42.3	11.0	2.3	6.7	95.8	18.4
Root crops	17.7	6.7	5.7	-3.0	98.5	3.4
Mungbean	1.8	-17.1	0.8	4.1	1.4	-13.7
Soybean	5.1	2.0	0.8	0.3	4.2	2.2
Peanut	12.8	9.2	1.0	0.2	13.0	9.4
Tobacco	6.5	-2.0	4.3	6.8	27.3	4.6
Cotton	6.5	-13.4	0.9	1.4	6.0	-12.2
Sugarcane	5.1	25.6	31.0	8.8	164.6	36.7

Source: Agriculture Statistics, 2000, DOP, MAF

Amongst upland crops, the annual production of sugarcane increased considerably by 36.7% p.a., followed by maize (18.4% p.a.), and peanut (9.4% p.a.) due to expansion of harvested area and improvement of unit yield. On the other hand, annual production of mungbean and cotton declined by 13.7% p.a. and 12.2% p.a., representatively, since the harvested area decreased due to low prices and the limited market for mungbean and cotton.

Considering the growth rate of production in the past five years, maize, peanut, soybean, sugarcane and some root crops are strong candidates for diversification. In addition,

FAO/WB Study (1999) noted that sesame, soybean, sunflower, sorghum and safflower have a comparative advantage. Cotton is also a candidate crops, since at present most raw materials are imported to Lao PDR for the handloom industry. Some upland field crops, including maize, soybean and cassava are used not only as food crops, but also as supplemental feed for livestock since the number of livestock is increasing considerably. Those crops will be a priority in the proposed program.

Although upland crop development is important to promote crop diversification, the research activity in upland crops is relatively weak and has lagged behind due to limited technical or financial resources. It is also noted that the technical level of staff is also very limited.

The proposed project should select recommended varieties and develop adaptive research technology at the field level. These recommended varieties and technology would be provided as technical packages through extension service on an area basis. The project will be carried out in Agriculture Research Center (ARC), located in Vientiane Municipality, under the National Agriculture and Forest Research Institute (NAFRI). In addition to ARC, it is required to implement trial experiments in provincial stations or farmers field to develop adaptive research technology on an area-specific basis. Adaptive research trials using methods from neighboring countries with similar agronomic condition would also be tested.

The training program of staff in the ARC and other staff in the province are also important subject in the project. The training will be made in the form of on-job training, study tour, and scholarship to universities or research institutes in other countries. In addition to these human resource developments, installation or upgrading of some equipment should be made in ARC. Necessary arrangements for the research stations and experimental fields should also be considered in the proposed project.

Proposed research activities in the project will be as follows:

(1) Overall research management including planning, and monitoring and evaluation,

(2) Selection of crop/varieties and conducting trials,

(3) Agronomy and soil fertility management,

(4) Plant protection, and

(5) Farming systems and agro-economy including marketing.

5. Project Components

(1) Technical assistance for implementation of research at ARC, provincial stations and in field experiments in terms of the above research areas,

(2) Technical assistance to develop a plan for future upland crop research and development, upgrading plan of equipment and stations, design, cost estimation as well as preparation of tender document,

(3) Adaptive research trials, demonstration plots and field testing,

(4) Upgrading of equipment in ARC and facilities/equipment of research stations at provincial level, and

(5) Implementation of key researcher training including on the job training and overseas training.

6. Project Costs

Total project cost is US$ 6,361 thousand consists. The detailed breakdown is shown below:

(Unit: Million US$)

Cost Item	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Total
Capital Cost	646	316	276	276	1,776	276	276	276	276	276	4,670
Recurrent Cost	179	164	163	163	208	163	163	163	163	163	1,691
Total	825	480	439	439	1,984	439	439	439	439	439	6,361

7. Implementing Agency

The Agriculture Research Center (ARC), NAFRI, Ministry of Agriculture and Forestry

8. Organizational and Staffing Requirements

The required number of staff is 33 in total and 21 additional staff will be required. Out of the 23 additional staff , 1 will be recruited and 20 will be appointed from existing PAFS or DAFO staff. The details are shown below:

	Present Staff	Proposed Staff	Balance
1. HVRC (Project Director)	1	1	0
2. Researchers in HVRC	11	12	1
3. Researchers in Stations or Experimental Field	0	20	20
Total	12	33	21

9. Implementation Schedule

The project will be implemented over 10 years according to the following schedule.

(1) 1st Year: Preparatory period for planning

(2) 2nd Year Upgrading of research equipment, technical assistance and training in ARC

(3) 3rd and 5th year: Technical assistance and training program in ARC

(4) 5th year: Mid-term review and re-planning of the project, upgrading of stations, technical assistance and training program in ARC

(5) 6th and 8th year: Technical assistance and training program in ARC and stations

(6) 9th and 10th year: Follow-up period and final evaluation

10. Lessons Learnt and How Incorporated into Proposed Project

It is observed in the other donor-assisted projects that many staff receiving training program leave the project for appointment to new jobs in the private sector. Trainees would have to enter into a bond prior to commencing training program agreeing to serve

in public sector for a specified period following completion of training.

11. Expected Benefit

    (1) The well-adapted varieties and technologies for upland crops will be developed

    (2) Upland crop productivity will be enhanced through using well-adapted varieties and technologies.

    (3) Crop diversification will be expanded.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    (1) Shortage of government counterpart budget for operation and maintenance cost of research center and stations.

    (2) Leaving off trained staff form ARC for assignment in private sector.

13. Assessment of Natural and Social Environment

    (1) Natural environment: No impacts are expected.

    (2) Social environment: No impacts are expected.

14. Special Arrangements

    None.

5. Livestock and Fisheries

Project No. LF-2

1. Title of Project/Program

   Animal Health Improvement Program

2. Location

   Nationwide

3. Objectives

   The Project aims to; (i) improve health condition of livestock and decrease livestock diseases and (ii) strengthen livestock services related to animal health.

4. Project/Program Description

   Current livestock hygiene programs are implemented according to national policy, but basic laws concerned with livestock hygiene have not been enacted. Moreover, technicians trained on necessary matters such as veterinary, medical facilities, equipment and medicine are insufficient, hampering effectiveness of programs. Consequently, losses of livestock due to disease are heavy, significantly restricting the productivity of livestock raising.

   According to the livestock development plan of DLF which has a target year set at the year 2020, the total production of livestock and related products is expected to be increased significantly and is estimated to reach three (3) times of that of the year 2000. For this, it is quite important to promote the improvement of livestock hygiene, which is a serious impediment to livestock production.

   The EU has been implementing a project "Strengthening of Livestock Services and Extension Activities" (1998~2004). The project consists of seven (7) items, such as amendment of veterinary law, check post, laboratory, extension, technical training, etc., which aim at strengthening livestock hygiene in Lao PDR. One of the EU's project components is rehabilitation of the deteriorated Vaccination Production Institute. Production capacity of vaccines after completion will be 15 million dozen per year, which is three times that of the year 2000. However, the Vaccine Production Institute estimates that the future increase in vaccination rate will require annual productions of vaccine estimated at 32, 37, and 75 million dozen per year, in 2005, 2010, and 2020, respectively, requiring a large increase in production. For this, Vaccination Production Institute is preparing a plan for expansion of the factory, which requires cooperation from external agencies to achieve the target. The extension is proposed for the six northern provinces, and this should be extended nation-wide in the future. Current vaccination fully depends on VVW but

overall effect of vaccination remains low due to low awareness of VVW staff about epidemics, low level of veterinary skill, etc. It is necessary for the national government to positively participate in the program to overcome epidemics and to train VVWs. Improvement of meat hygiene and quarantine systems for transported livestock should be accelerated.

5. Project Component

The main components of project activities are itemized as follows:

(1) Expansion of production of vaccine in Vaccine Production Institute.

(2) Technical training for VVWs and staff of PLFO/DLFO.

(3) Strengthening of meat inspection system including check posts.

(4) Establishment of a protection system against epidemic disease at the provincial level.

6. Project Costs

The project cost is estimated at about US$ 9.5 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Capital cost	690	690	690	1,890	1,890	1,890	270	270	90	8,370
Recurrent cost	124	124	124	160	160	160	111	111	106	1,178
Total	814	814	814	2,050	2,050	2,050	381	381	196	9,548

The above cost is estimated based on the data from DLF and Vaccine Production Institute.

7. Implementing Agency

DLF with assistance from MAF

8. Organizational and Staffing Requirements

Component	Present Staff No.	Proposed Staff No.	Balance
Operation			
a. Vaccine Institute	25	40	15
c. PLFO	40	80	40
Total	65	120	55

9. Implementation Schedule

(1) Improvement of PLFO/DAFO $1^{st} - 5^{th}$ Year

(2) Supply of equipment for PLFO/DLFO $2^{nd} - 5^{th}$ Year

(Meat inspection and quarantine station and check posts)

(3) Expanding of Vaccine Institute $5^{th} - 8^{th}$ Year

(4) Technical tainting of epidemic disease of PLFO/DLFO staff 5^{th} – 9^{th} Year

(Technology of epidemic disease prevention and meat inspection)

(5) Supply of equipment for vaccine institute 7^{th} – 8^{th} Year

(6) Technical training for VVWs 7^{th} – 9^{th} Year

(Technology of animal health)

10. Lessons Learnt and How Incorporated into Proposed Project

(1) Livestock hygiene programs, particularly on epidemic diseases, should be conducted nationwide, however, previous projects have covered only a limited area.

(2) Rehabilitation of Vaccine Production Institute was implemented, however, target production proposed by Vaccine Production Institute will not be achieved.

(3) The livestock hygiene program will be implemented nationwide. The vaccine production program was modified to achieve the target production.

11. Expected Benefit

(1) Livestock disease will be decreased by adequate supply of vaccine.

(2) Diagnosis, treatment, and prevention of animal disease will be done more exactly through the technological improvement of veterinarian technicians.

(3) Meat sanitary inspection will be strengthened reducing related health problems for consumers.

(4) Quarantine for the movement of livestock will be strengthened, and the spread of an epidemic will be prevented. Reliability of supply for export will be improved.

(5) The epidemic prevention program will be strengthened at the provincial level .

12. Assessment of Possible problems and Bottlenecks in Implementation

A sufficient number of skilled staffs of DLF is required.

13. Assessment of Natural and Social Environment

(1) Natural environment: No impacts are expected.

(2) Social environment: No impacts are expected.

14. Special Arrangement

None

TERMS OF REFERENCE

FOR

THE ANIMAL HEALTH IMPROVEMENT

IN

THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

1. Background and Justification

The improvement of livestock hygiene is considered as a priority for the development of livestock production in Lao PDR. Presently there are few laws and regulations on livestock hygiene, and the livestock support services could not handle all required regulatory and extension works assigned under the National Livestock Hygiene Policy and Program. The provincial and district services are lacking trained veterinary technicians, veterinarian facilities, equipment and drugs/vaccines to implement the program. Thus, there are cases of heavy animal losses due to epidemic diseases that hamper the productivity of livestock in the country.

A project profile for animal health improvement was elaborated with the objectives to improve health condition of livestock and reduce livestock diseases and to strengthen animal health services of the local Livestock and Fisheries Service Office. The project will be implemented by the Ministry of Agriculture and Forestry (MAF) with the technical assistance specified in the following paragraphs.

2. Objective of the Technical Assistance

The Technical Assistance aims to support the improvement of the national animal health services by strengthening the capacity of the Vaccine Production Institute and the provincial and district livestock and fisheries offices (PLFO/DLFO). This will be done through the improvement of the Vaccine Institute's facilities, equipment and labor force, through strengthening the capacity of the PLFO/DLFO institutions and through training government staff and Village Veterinary Workers (VVW).

The Technical Assistance would also provide necessary support in term of management during the preparation, implementation and evaluation of the project. At the completion of the project, the technical assistance should be able to present important lessons learned and sound recommendations for fine tuning the project's strategic approach, implementation design and feature to sustain the follow-up or replication of the development objectives and activities after the

completion of the project.

3. Scope of Work

The approach of the project is to increase the production of vaccines according to the need of the National Animal Health Improvement Program. At the same time the project will strengthen the capacity of the government services in conducting their regulatory function such as meat inspection and in conducting extension work through training of FSEW and VVWs. At the later stage, an epidemic disease protection system will be elaborated.

The technical assistance will assure the well functioning of the animal health improvement program and will establish the necessary steps to further expand the model developed under the project to other provinces and establish a nation wide system.

The technical assistance will ensure the implementation of the project and the capacity building through transfer of knowledge and training of government staff and farmers.

4. Specific Tasks

Pursuing the scope of work defined above, the technical assistance will follow the specific tasks for each main project components as below.

(1) Expansion of vaccine production in the Vaccine Production Institute.

- To study the present capacity and condition of the Vaccine Production Institute.
- To elaborate an improvement plan of the Institute including management of the vaccine production, facilities improvement, improvement of equipment and machinery, and human resource development.
- To assist in the management and vaccine production of the Institute including quality control and technology innovation.
- To assist in the procurement of new equipment and machinery for the Institute.
- To assist in the training of staff for the use of new equipment and machinery and in production management.

(2) Strengthening Provincial and District Livestock and Fisheries Offices

- To study the present capacity and condition of the PLFO, DLFO and

existing provincial animal health centers.

- To elaborate a PLFO and DLFO strengthening plan including animal health centers strengthening plan in selected provinces (preferably in Southern Laos).
- To elaborate training and extension programs for FSEWs and VVWs in cooperation with existing Regional Agriculture and Forestry Extension Training Centers (RAFETC).

(3) Strengthening meat inspection regulatory work

- To revise laws and regulations on animal health and livestock hygiene.
- To strengthen the existing regulatory framework of the PLFO/DLFO for meat inspection and livestock quarantine.
- To establish and implement new regulatory inspections and measures for meat inspection and livestock quarantine including the improvement of livestock check posts.

(4) Establishment of a protection system against epidemic level at provincial level.

- To establish and implement new regulatory framework to prevent epidemic disease.
- To strengthen the animal disease prevention system at district and village level.

(5) Project operation, monitoring and evaluation.

A project operation, monitoring and evaluation system, which involve capacity building of the local institution will be elaborated for implementation of the project. The technical assistance task will be:

- To ensure that outputs, outcomes and impacts emerging at each steps of the project implementation have been realized towards achieving the implementation progress and development objectives. Therefore, proper monitoring and evaluation will be conducted in relevance with the scope and work schedule of the project.
- To ensure the correct utilization of project funds including those from the local contribution through the implementation of the Project's Financial Regulations.
- To ensure the correct operation and utilization of project's facilities, equipment and materials during the overall duration of the project.

Assistance to the overall project management by the team leader will be:

- To assist the Project Director/Coordinator in the overall project management and coordination among government agencies.
- To assist the Project Director/Coordinator for the preparation of annual implementation program and budget arrangement.
- To assist the Project Director/Coordinator for monitoring the work progress of each sub-project components.
- To assist the Project Director/Coordinator for the preparation of regular progress reports.

(6) Reporting

The following reports shall be prepared and provided.

(a) Inception report

To be submitted by the end of the third month after the commencement of the technical assistance services. The report will contains overall work schedule, work plan, administrative arrangement, results the review of existing data/ information during the inception period.

(b) Monthly progress report

To be submitted at a monthly interval, which contains mobilization reports, man-months consumed, summary of work progress during the reporting month, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next month.

(c) Quarterly progress report

To be submitted at three month interval, which gives a summary of the consultant's activities, work progress during the reporting period, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next quarterly period.

(d) Annual report

To be submitted at the annual assignment, which gives a summary of the consultant's activities, work progress during the reporting period, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next year.

(e) Completion report.

To be submitted, upon completion of all services, giving all aspects related to the project management and the project works.

(f) Project management formulation report

To be prepared for reporting the current formulation status of the project management. The report will comprise of a summary of the project management system and implementation, including guideline with checklist for sub-project identification and reporting format.

(g) Specific technical reports

After the completion of each long term and/or short term assignment each individual expert will submit his/her individual technical report/note on the technical support implemented and accomplished during the period assigned to work with the project.

In addition to the individual technical reports, the following technical report will be provided as result of technical group work.

- Strengthening Animal Health Conditions in Lao PDR.
- Livestock Epidemic Disease Protection System, the Case of Lao PDR.

5. Expertise Requirements

A team of consultants, which may be and academic or research organization, or and independent consulting firm, will be engaged to undertake the consulting services as specified above. This would include international and local expertise in following.

(1) Team Leader Animal Health Specialist (International) for a total of 36 man/months to assist in the design, establishment and implementation of animal health improvement program.

(2) Vaccine Production Specialist (International) for a total of 24 man/month to assist in the improvement of the Vaccine Production Institute.

(3) Livestock Extension and Training Specialist (International) for a total of 12 man/month to assist in the development of training and extension program for PLFO/DLFO staff and VVWs.

(4) Institutional and Legal Specialist (International) for a total of 12 man/month

to assist in the development of regulatory framework for meat inspection and epidemic disease prevention.

(5) Vaccine Production Expert (local) for a total of 36 man/month to assist in the improvement of the Vaccine Production Institute.

(6) Training and Extension Specialist (2 Local) for a total of 108 man/month to assist in the design and elaboration of necessary training and in the implementation of the training and extension for FSEWs and VVWs.

(7) Institutional and Legal Specialist (Local) for a total of 24 man/month to assist in the development of regulatory framework for meat inspection and epidemic disease prevention.

(8) Unspecified Backstopping Expertise to be specified in the current of the project implementation. This will include 3 man/month international and 24 man/month local.

6. Time Frame

The time frame of the project is of nine years. However, the time frame of the technical assistance is defined for 5 years under this TOR. The following time frame is tentatively proposed for the mandate of the consultant team.

	Time Frame	m/m	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
1	**International**													
	Team Leader / Animal Health	36												
	Vaccine Production Expert	24												
	Livestock Extension and Training	12												
	Institutional and legal Expert	12												
2	**Local**													
	Vaccine Production Expert	60												
	Training and Extension Specialist	60												
	Training and Extension Specialist	48												
	Institutional and Legal Specialist	24												
3	**Unspecified Backstopping Expert**													
	International	3												
	Local	24												

Project No. LF-5

1. Title of Project/Program

   Livestock Productivity Enhancement Program

2. Location

   Nationwide

3. Objective

   The Project aims to increase livestock productivity through improvement of animal feed supply.

4. Project/Program Description

   Current livestock production of Lao PDR depends substantially on small holding livestock farmers. Feed management is mostly conducted extensively by grazing of natural pasture, which causes decreased weight and exhausting of physical strength along with shortage of animal feed during the dry season and lack of proper livestock hygiene management. Accordingly, productivity and quality of the products remain low. However, the livestock sector of Lao PDR is considered to be growing as domestic consumption and export of products is expected to increase. According to the livestock development plan of DLF whose target year is set at the year 2020, the total production of livestock and related products is expected to increase by three (3) times that of the year 2000. For this to occur, it is quite important to increase productivity by improving the present extensive feeding method. Though Livestock Resources Center of NAFRI, which was constructed by Australian aid, is available in Lao PDR, the laboratory has not been wellequipped. The Animal Feed Laboratory, which was established under DLF in 1982, has six staff. Its main activity is analysis of feed, but it is a small facility and some equipment are not being used due to deterioration. Therefore, very little research on the animal feeding and feed is conducted.

   In order to improve this situation and enhance the productivity, the project will activate the Animal Feed Laboratory of DLF at the central level and improve facilities and equipment of those at the district level. Research items at the central level will consist of; i) pasture land and cultivation of fodder crops, ii) processing, iii) storage, iv) standardizing of feeding, v) test on capability of animal, vi) mechanization of fodder crop cultivation, etc. The research results will be transferred and extended to the centers at district level, then to the farmers. Staff in charge of animal feeding and feed will also be trained.

5. Project Component

The main components of project activities are itemized as follows:

(1) Improvement of the animal feed laboratory including the provisional livestock performance test facilities.

(2) Establishment of livestock feeding standards.

(3) Improve the district animal centers including the rehabilitation of facilities and training of the staff.

(4) Provide improved technology on livestock feeding through technical demonstration and training.

6. Project Costs

The project cost is estimated at about US$ 9.5 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Capital cost	690	690	2,690	2,690	690	390	270	270	8,380
Recurrent cost	124	124	184	184	124	115	111	111	1,075
Total	814	814	2,874	2,874	814	505	381	381	9,455

7. Implementing Agency

DLF with assistance from MAF

8. Organizational and Staffing Requirements

Component	Proposed Staff No.
Operation of Laboratory	
a. Animal feed research unit	4
b. Feeding standard unit	4
c. livestock performance unit	4
d. Test animal feeding unit	4
e. Agriculture machine unit	4
f. Administration unit	3
Total	23

9. Implementation Schedule

(1) Improvement of the district animal centers $1^{st} – 5^{th}$ Year

(2) Improvement of the animal feed laboratory $3^{rd} – 4^{th}$ Year

(3) Establishment of the livestock feeding standard $3^{rd} – 7^{th}$ Year

(4) Technical training of staff (feed laboratory) $5^{th} – 7^{th}$ Year

(5) Technical training of district staff $6^{th} – 8^{th}$ Year

10. Lessons Learnt and How Incorporated into Proposed Project

    (1) Improvement program of animal feed production is available but nationwide extension of technique has not been done. Technicians for Incubators for animal feeding are not available.

    (2) In this project, the central animal feed laboratory will be rehabilitated and training of technicians will be conducted so that the improved animal feed production technology and animal feeding technology can be extended nationwide.

11. Expected Benefit

    As a direct effect of the project, the productivity of livestock will be enhanced, domestic consumption and export supply will meet their requirements or demands, and accordingly, increase of producers' profit will be realized.

    (1) Livestock feeding will be improved both in terms of quantity and quality, by shifting from extensive feeding with natural pasture to application of feed crops and improved pasture.

    (2) Productivity of individual livestock will be improved.

    (3) Production of animal feed by individual farmers will be possible, which will enable them to conduct economical feed management.

    (4) Capacity building for province-level staff will realize efficient technical guidance to livestock farmers on feed production and management.

    (5) New technology on livestock feeding management will be acquired through demonstration and training.

12. Assessment of Possible Problem and Bottlenecks in Implementation

    Shortage of capable staff in DLF will limit progress of the project.

13. Assessment of Natural and Social Environment

    (1) Natural environment: No impacts are expected.

    (2) Social environment: No impacts are expected.

14. Special Arrangement

    None.

Project No. LF-6

1. Title of Project/Program

   National Animal Health Center Improvement

2. Location

   Nationwide

3. Objective

   The Project aims to strengthen capability of the National Animal Health Center.

4. Project/Program Description

   In Lao PDR, services on health control of livestock are insufficient at present due to shortage of research institutes, trained veterinarians, medical facilities, medical equipment and medicine for livestock. Consequently, losses of livestock production due to diseases are heavy. On the other hand, the livestock sector has a strong expectation that domestic consumption of livestock products and exports should be expanding in the near future. Such expectation should be satisfied promptly by settling the problems on the health control of livestock, and effective production of livestock should be realized. In order to settle the problems, improvement of technology on the health control of livestock as the basis of the program, diagnosis technique of livestock diseases and strengthening of the existing research institutes in particular are necessary.

   Animal Disease Diagnostic Laboratory under DLF is the only research institute for the health control of livestock in Lao PDR. Although there are is central laboratory in Vientiane and four regional laboratories, facilities and equipment are insufficient in all the laboratories. Moreover, the number of laboratories at provincial level is quite insufficient to cover the whole country. An EU project titled "Strengthening of Livestock Service and Extension Activities" aims to improve the whole program to improve the health control of livestock including related veterinary laws. Improvement of some of the facilities and equipment of the Animal Disease Diagnostic Laboratory's central and two provincial laboratories in Louangphrabang and Champasak Province were implemented and some of the improvement was completed. However, research activities at the national laboratory are restrained due to limited space allocated to the laboratory. No laboratory has been established in four provinces in northern region, namely, Phongsali, Louangnamtha, Oudomxai and Houaphan Province. DLF has already commenced a program consisting of the improvement of the central laboratory and construction of new provincial laboratories in the above four provinces. Full

implementation of the program at an early stage will play a significant role in the livestock production of Lao PDR.

5. Project component

The main components of project activities are itemized as follows:

(1) Improvement of the animal disease diagnostic laboratory.

(2) Establishment of four regional level laboratory.

(3) Establishment of a vaccine quality check unit.

(4) Provision of technical training to staff.

6. Project Costs

The project cost is estimated at about US$ 5.9 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Capital cost	1,390	1,390	890	390	390	390	270	270	5,380
Recurrent cost	42	93	78	63	63	63	60	60	522
Total	1,432	1,483	968	453	453	453	330	330	5,902

The above costs are based on the data from DLF.

7. Implementing Agency

DLF with assistance from MAF

8. Organization and Staffing Requirements

Component	Proposed staff No.
Operation of Laboratory	
a. Vaccine quality check unit	4
b. Epidemiology unit	4
c. Bacteriology unit	3
d. Parasitology unit	3
e. Pathology unit	3
f. Toxicology unit	2
g. Virology unit	3
h. Test animal feeding unit	2
i. Administration unit	3
j. Regional Level Laboratory	16
Total	43

9. Implementation Schedule

Schedule of construction work of the building

(1) Improve of the laboratory $1^{st} – 3^{rd}$ Year

(2) Training of staff $4^{th} – 8^{th}$ Year

10. Lessons Learnt and How Incorporated into Proposed Project

(1) Rehabilitation of part of Central Diagnostic Laboratory and necessary equipment was procured.

(2) Equipment was procured only for two Field Diagnostic Laboratories out of four. Number of the Laboratory is not sufficient in northern region.

(3) In this project, a function of "National Animal Health Center" will be attached to the Central Diagnostic Laboratory, and four new Field Diagnostic Laboratories will be constructed in the northern region.

11. Expected Benefit

The project aims at research on health control of livestock at central level of Lao PDR. The project will contribute to the health control of the livestock over Lao PDR by extending its outcome to the end farmers, and will promote not only efficient livestock production, but also increase of income of livestock farmers.

(1) The prevention efficiency against infectious disease will be enhanced by the improvement of the quality of vaccine supplied to District or Village.

(2) The substance of infectious disease becomes definite, and the diagnosis, treatment, prevention countermeasures will be applied early.

(3) The export of the livestock and quarantine technology for livestock transport will improve. The prevention of the spread of epidemics and reliability of export goods will rise as a result.

(4) Animal health control will be improved as a whole, which should decrease the diseases guided by skilled veterinarian technicians trained by the project.

12. Assessment of Possible Problem and Bottlenecks in Implementation

Shortage of capable staff in DLF will limit progress of the project.

13. Assessment of Natural and Social Environment

(1) Natural environment: No impacts are expected.

(2) Social environment: No impacts are expected.

14. Special Arrangement

None.

Project No. LF-10

1. Title of Project/Program

   Aquaculture Improvement and Extension Project.

2. Location

   Namxuoang aquaculture center and Nongteng fish farm in the Vientiane municipality.

3. Objectives

   To establish the Namxouang aquaculture center and develop the capabilities of counterparts in aquaculture technology improvement and extension activities throughout the country.

4. Project/Program Description

   The fishery industry in Laos provides 40 to 50 % of the total protein requirements for the people. Aquaculture development in the country, with plentiful water resources, is very important for food security, economic development in the rural areas and sustainable utilization of resources.

   However, the existing subsistence aquaculture has problems such as a lack of suitable scientific technologies, a shortage of fish fry/fingerlings and a lack of human resources and equipment for developing appropriate technologies and training.

5. Project Components

   The project activities will be as follows:

   (1) To set-up and test-operate facilities at the Namxuoang aquaculture center.

   (2) To improve the capabilities of counterparts through on-the-job training as well as training in Japan and other countries in the region.

   (3) To undertake experiments on seed production (fry or eggs) and aquaculture techniques related to the target species, i.e. tilapia, common carp, puntius and catfish.

   (4) To train provincial and district extension officers in aquaculture.

   (5) Collection of information on the present situation of aquaculture and the formulation of a future aquaculture extension plan.

   (6) To exchange views and information through field trips and seminars with other development projects, institutions and extension organizations related to

aquaculture and fisheries.

6. Project Costs

The project cost is estimated at about US$ 5.6 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Capital cost	1,256	450	450	1,125	450	450	450	450	5,081
Recurrent cost	88	64	64	84	64	64	64	64	556
Total	1,344	514	514	1,209	514	514	514	514	5,637

7. Implementing Agency

The department of livestock and fisheries of the ministry of agriculture and forestry

8. Organizational and Staffing Requirements

This program will be implemented under the present organizational framework of the government. Ten local officers and four foreign experts will be assigned.

9. Implementation Schedule

The program will be implemented for a total period of eight years by dividing it into two phases, i.e., phase I for the initial 3 years and phase II for the remaining five years.

10. Lessons Learnt and How to Incorporate them into the Proposed Project

A lack of suitable scientific technologies, a shortage of fish fry/fingerlings and a lack of human resources are the main problems in the existing subsistence aquaculture.

11. Expected Benefit

(1) Aquaculture technology and extension capability of counterparts will be improved.

(2) Seed production and aquaculture techniques related to the target species will be improved.

(3) Knowledge and techniques on aquaculture of provincial and district extension officers will be improved.

(4) Many farmers will benefit from provision of improved fish.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) The participatory extension methodology is not applied by the project. The research and training subjects to be determined in the center may have little systematic reflection of the actual needs of rural farmers.

(2) The extension of technologies taught to and developed for farmers is not planned. so there may be little possibility of substantial training and extension because of a lack of recurrent budget.

13. Assessment of Natural and Social Environment

(1) Natural environment: There should be a positive impact through better and sustainable use of resources.

(2) Social environment: Increased and sustainable fish production will lead to improvement in income and the quality of life.

14. Special Arrangements

None

Project No. LF-11

1. Title of Project/Program

   Fish Seed Centers Rehabilitation/Expansion Project.

2. Location

   The following eight province:

   Bokeo, Phongsali, Borikhamxai, Attapu, Khammouan, Houaphan, Savannakhet, Saravan.

3. Objectives

   To establish or rehabilitate aquaculture centers and to develop the capability of officers for technology improvement and extension activities in the field of aquaculture.

4. Project/Program Description

   Fisheries provide the people with 40 to 50% of their total protein requirements. Aquaculture plays a significant role with plentiful water resources for food security, economic development in the rural areas and sustainable utilization of resources.

   However, the existing subsistence aquaculture has problems such as a shortage of fish fry/fingerlings (seed), a lack of appropriate technologies, and a lack of human resources and equipment for developing appropriate technologies.

   Not every province has a fish seed center and even some of those with seed centers are in need of rehabilitation. There is no fish seed center in Bokeo, Phongsali, Borikhamxai and Attapu provinces. Seed centers in Khammouan, Houaphan, Savannakhet and Saravan provinces need rehabilitation.

5. Project Components

   The project activities will be as follows:

   (1) To set-up a new fish seed center for the respective provinces of Bokeo, Phongsali, Borikhamxai and Attapu.

   (2) To rehabilitate fish seed centers in Khammouan, Houaphan, Savannakhet and Saravan provinces.

   (3) To provide training to central, provincial and district government officers to improve the capabilities.

   (4) To carry out experiments on seed production and aquaculture techniques.

(5) To study the present situation of aquaculture to formulate an aquaculture extension plan.

(6) To exchange views and information through field trips and seminars with other development projects, institutions and extension organizations related to aquaculture and fisheries.

6. Project Costs

The project cost is estimated at about US$ 6.9 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
Capital cost	5,060	360	360	360	360	6,500
Recurrent cost	193	52	52	52	52	401
Total	5,253	412	412	412	412	6,901

7. Implementing Agency

The department of livestock and fisheries of the ministry of agriculture and forestry

8. Organizational and Staffing Requirements

This program will be implemented under the present organizational framework of the government. Forty local officers will be newly assigned to the new centers.

9. Implementation Schedule

The program will be implemented for five years.

10. Lessons Learnt and How to Incorporate them into Proposed Project

The existing subsistence aquaculture has problems such as a lack of suitable scientific technologies, a shortage of fish fry/fingerlings and a lack of human resources and equipment for developing appropriate technologies and training.

11. Expected Benefit

(1) Aquaculture technology and extension capability of officers will be improved.

(2) Seed production and aquaculture techniques related to the target species will be improved.

(3) Knowledge and techniques on aquaculture of provincial and district extension officers will be improved.

(4) Many farmers will benefit from improved seed supply.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) The commercial production of fish seed might be better performed by the

private sector.

(2) Recurrent costs for the operation of the centers except salaries and allowances will not be supplied to the centers. There would be some difficulty in continuation of the operation and there might be some unscrupulous accounting practices.

13. Assessment of Natural and Social Environment

(1) Natural environment: There should be a positive impact through better and sustainable use of resources.

(2) Social environment: Increased and sustainable fish production will lead to improvement in income and the quality of life.

14. Special Arrangements

None

Project No. LF-12

1. Title of Project/Program

Rural Aquaculture Development

2. Location

Villages with permanent reservoirs will participate in the project. The following 12 provinces excluding five provinces already assisted by the UNDP/FAO Provincial Aquaculture Development Project will participate.

Phongsali, Louangnamtha, Bokeo, Louangphrabang, Houaphan, Vientiane, Xaisomboun, Borikhamxai, Khammouan, Saravan, Champasak and Attapu

3. Objectives

To develop aquaculture in rural area through the provision of approprioate technologies, equipment, training and funds.

4. Project/Program Description

Fish consumption in the whole nation is rather small. According to the household consumption and expenditure survey by SPC in 1997/98, per-capita consumption of fish was estimated at 5.3 kg/year for the north region, 12.4 kg/year for the central region and 11.8 kg/year for the south region. About 40 to 50% of the total requirement of animal protein are obtained from fish. Fish play an important role in the nutrient supply and there is a large potential demand in the context of low protein intake.

Capture fisheries are the dominant source of fish for consumption. According to the 1999 agricultural GDP statistics, 53 % of total fish production was from the Mekong river, 13% from the Nham Ghum reservoir and 34% from other sources. Natural fish resources are limited and the supply will not increase significantly over time. Mountainous areas far from the Mekong and Nham Ghum reservoir are short of fish.

This is a project to develop aquaculture by dissemination of revolving funds and of aquaculture technologies through on-site training. Financing will be done for the production of fish from ponds, floating net cages or in paddy fields, and for the production of fingerlings, or fish feed, and the installation of freezing machine in the dam body.

5. Project Components

The project is composed of the following components.

(1) Development of private mini-hatchery centers.

(2) Provision of the following aquaculture technologies to farmers through community.

a. Pond culture,
b. Rice-fish integrated farming,
c. Community fishing,
d. Cage culture, and
e. Fish-livestock integrated culture.

(3) Provision of credit for construction and operation of fishponds through revolving funds to communities.

(4) Development of mini-fish-feed mills.

(5) Marketing of fresh fish through production of ice by freezers operated by water flow from the existing dams, not by electricity.

6. Project Costs

The project cost is estimated at about US$ 2.3 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Capital cost	441	270	0	441	270	0	441	270	0	2,133
Recurrent cost	24	18	10	24	18	10	24	18	10	157
Total	465	288	10	465	288	10	465	288	10	2,290

7. Implementing Agency

The department of livestock and fisheries of the ministry of agriculture and forestry will be the executing agency of the project. Management of individual sub-projects will be done by the women's union in cooperation with PAFSOs.

8. Organizational and Staffing Requirements

Approximately 135 government officers at the provincial level were trained for aquaculture in the FAO/UNDP provincial aquaculture development project. After termination of the project, these experts appear to be engaged in the administrative work in agriculture in the respective provinces. Provision for the continuation of aquaculture training barely exist due to the lack of training and extension budget. The expertise of the trained personnel is under utilized for the expansion of aquaculture. There are plentiful teaching materials on aquaculture that were produced by the FAO/UNDP project. Therefore, there is not a great need to train trainers if these experts can be transferred to the targeted provinces. Some additional technologies will be developed and made available in aquaculture improvement and extension project assisted by JICA.

Ten aquaculture experts will be assigned to the project site, 2 persons per site. They will transfer their skill and knowledge on aquaculture to farmers, the women's unions and the PAFSO/DAFSO staff in the targeted provinces.

9. Implementation Schedule

The project will be implemented in three phases, three years for each phase. Four provinces will be developed in each phase.

10. Lessons Learnt and How to Incorporate them into the Proposed Project

The previous UNDP/FAO aquaculture projects have demonstrated that aquaculture was a viable means to improve food security and generate income in rural areas. The main lessons learned from the previous projects are as follows:

(1) The supply of fish fry and fingerlings is insufficient to meets farmers' requirements.

(2) Lack of viable institutional credit system is the most significant problem for aquaculture development.

(3) The training by technicians and extension officers in aquaculture has not been extended to many farmers. The establishment and sustenance of an extension network at the farmers' level is very important.

(4) The extension methodology of identifying targets farmers, training them in aquaculture and developing them as model farmers who serve as extension agents has been very effective.

(5) The majority of the target farmers who benefited from earlier projects were not necessarily the poorer ones.

(6) The community approach such as entire villages, rather than individual targets or model farmer approach, appears to be more efficient in helping poorer farmers access institutional credit and to support each other in technological adoption, input provision, marketing and pricing. Farmer to farmer contact and exchange of experience is a valuable tool in the extension process.

(7) Targeting remote communities limits the impact on a wider scale. Road access to target groups is critical for successful support.

(8) Provincial hatcheries are unreliable as a source of fish fingerlings due to conflicting priorities between development activities and commercial viability.

(9) Farmer-based fingerling production is extremely successful and facilitates access to fish culture by groups previously excluded.

(10) Due to limited numbers and capacity of counterparts in the provinces, it is better to spread a few activities across a range of provinces than to focus many in one place. The more projects that are active in a particular province, the more likely it is that conflicts over staff availability and implementation approach will occur.

(11) Involving mass organizations in project implementation can be another way for effective targeting and project management.

(12) Feeding of fish is not a common practice in Laos. Fish are kept for a long time, sometimes more than 1 year, and harvested when needed. For commercial as well as subsistence aquaculture operation, the supply of sufficient fish feed from natural sources or mills is critical. There are no fish feed mills in the country. Animal feeds can be substituted for fish feed but imports are banned by law. Import of fish feed is virtually prohibited.

11. Expected Benefits

(1) Protein intake by the participating villages will increase substantially, resulting in better health conditions, particularly of children.

(2) Income of the farmers in participating villages will be significantly increased.

(3) Poorer farmers in the villages will be alleviated from their adversity.

(4) Neighboring villages will participate in the development of aquaculture by using revolving funds.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Financial management of the revolving funds by the women's union in the participating villages/districts/provinces has not been well demonstrated.

(2) Participation of non-members in the decision making of the union is difficult. There may need to be some mechanism for the selection of representative of the union by the common farmers.

(3) There may be some difficulty in the relocation of the staff to other provinces.

13. Assessment of Natural and Social Environment

(1) There should be a positive impact through better and sustainable use of resources.

(2) Increased and sustainable fish production will lead to improvement in income and the quality of life.

14. Special Arrangements

None

6. Stabilization of Shifting Cultivation

Project No. SC-1.1

1. Title of Project / Program

   Stabilization of Shifting Cultivation in the Southern Region

2. Location

   Salavan, Sekong and Attapu provinces

   A study of the on-going and planned programs, for stabilization of shifting cultivation and opium poppy elimination, indicate that the northern areas are receiving substantial attention from a range of projects and donor agency assistance. These programs have strong components for assisting the development of sustainable farming systems and alternative income generating activities.

   However, in the southern provinces of Salavan, Sekong and Attapu, there remain areas of shifting cultivation where there are no current or planned programs to assist communities stabilize farming activity following scheduled land allocation. Thus, this project is formulated to address the needs in these provinces.

3. Objectives

   To stabilize shifting cultivation in upland areas of Salavan, Sekong and Attapu provinces by the year 2010 through the development of sustainable land-use systems and other income generating activities which are non-hazardous to the environment.

4. Project Description

   In 1998 nationwide, there remained about 156,720 families practicing shifting cultivation on about 148,000 hectares[1], based on government statistics. Figures for 1995 are given as 198,868 households practicing shifting cultivation on 192,258 hectares and about 120,000 hectares remaining by the year 2000.

   A Department of Forestry National Reconnaissance Survey made in 1992 indicated the area under upland crops nationwide was 626,000 hectares in 1989. This compares to a slightly lower estimate made for 1982 of 597,000 hectares. Based on these figures, and the projected influence of population increase in upland communities, it is considered that in the year 2000 a total of about 689,000 hectares of uplands was under annual field crops. This is 5-6 times the area recorded as remaining under shifting cultivation. For the three provinces in the southern region, statistics indicate that 6,000 hectares remains under shifting cultivation. On the above basis there may be up to a total 30,000 hectares under upland crops annually.

   Whilst the statistics illustrate a significant reduction in shifting cultivation, general experience in upland areas is that communities are not effecting commensurate changes in farming systems and productivity improvements to maintain or increase living standards. Thus, it is expected that assistance in development of sustainable farming systems and

[1] The Government's Strategic Vision for the Agricultural Sector, MAF, Vientiane, Lao PDR December 1999.

other income generating activity is required in all upland areas, including those areas where agricultural land allocation has been carried out. This is needed to provide continued assistance to upland communities in adapting their diverse livelihood systems, to achieve self-reliance and to improve livelihoods, on a reduced land resource base.

In these three southern provinces, to achieve stabilization of shifting cultivation with improved family livelihoods and sustainable use of natural resources, the steps needed are:

(1) A study of shifting cultivation areas including: extent, livelihood systems and options in relation to stabilization of shifting cultivation.

(2) Selection of target areas for priority project intervention.

(3) Mobilization and implementation of projects in the three target provinces.

5. Project Components

(1) Participatory land-use planning and allocation.

(2) Village development planning & extension.

(3) On-farm adaptive farming systems research (extension / farmer linked).

(4) Sustainable management and utilization of NTFPs.

(5) On-farm tree seedling nursery promotion.

(6) Monitoring & evaluation.

As the provincial and district teams gain and consolidate experiences, additional target villages can be added to the annual work plan.

Annual training activities to be conducted within each component to be based on needs assessment (staff and villagers) for successful implementation of work plans. Human resource development training is addressed in other proposed projects in the HRD sub-sector of the Master Plan Study.

6. Project Costs

For the period of 9 years, a budget frame of about US$ 10.5 million will be required as shown below.

(Unit: US$ 1000)

	Phase I				Phase II					Total
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	
Capital cost	1,020	780	780	780	780	780	780	780	780	7,260
Recurrent cost	371	363	363	363	363	363	363	363	363	3,277
Total	1,391	1,143	1,143	1,143	1,143	1,143	1,143	1,143	1,143	10,537

7. Implementing Agency

The Provincial Agricultural & Forestry Services of MAF.

8. Organizational and Staffing Requirements

This program will be implemented under the present organizational framework, but with an operational structure for Provincial and District staff as envisaged in the government's vision for the agricultural sector. Staff required on a full time basis are as follows:

Team	Present Staff No.	Proposed Staff No.	Balance
Provincial Coordinators	3	3	0
P Farming Systems SMS	3	3	0
P NTFP SMS	3	3	0
P Monitoring & Evaluation	3	3	0
District extension	6	6	0
Total	18	18	0

Note: Selected within available staff and trained plus provision for adequate field allowance.

Other Provincial and District staff resources will be required as appropriate to the village level activities. For example during land-use planning and allocation in target districts.

9. Implementation Schedule

This is proposed for 2 periods: phase I (4 years) and phase II (5 years). Following a review and evaluation in the 4th year, proposals for phase II would be revised as necessary.

10. Lessons Learnt and How Incorporated into Proposed Project

Lessons learnt from past projects need to be incorporated during the detailed project design. The main considerations here are the design for participatory involvement of the target communities in the village development planning processes and the provision for on-farm research/extension liaison and application to problems and opportunities identified during the participatory planning processes.

11. Expected Benefit

(1) Improved livelihoods of target communities.

(2) Reduced erosion and other environmental damage.

(3) Reduced exploitation of forest resources.

12. Assessment of Possible Problems and Bottlenecks in Implementation

Staff with suitable qualifications and experience cannot be assigned to project implementation.

13. Assessment of Natural and Social Environment

(1) Natural environment: Positive impacts through improved soil and water conservation, reduced community dependence on forest resources.

(2) Social environment: Positive impacts through reduction of poverty and community participation on the development process.

14. Special Arrangements

Nil.

Project No. SC-1.2

1. Title of Project / Program

   Stabilization of Shifting Cultivation in the Northern Region.

2. Location

   The major remaining critical areas of shifting cultivation are in the north. Many of these highland areas are very remote where opium cultivation, whilst declining, is still practiced[2]. Under the umbrella of the UNDCP/LCDC proposed program there are six (6) area based *"Alternative Development Projects"* proposed for the period 2001-2006. These are as follows:

   a. Houaphan Alternative Development Project (HADP); Houaphan
   b. Khua Mai Alternative development Project (KMADP); Phongsaly
   c. Long Alternative Development Project (LADP); Louangnamtha
   d. Louangphrabang Alternative Development Project (LPBADP); Louangphrabang
   e. North Phongsaly Alternative Development Project (NPADP); North Phongsaly
   f. Oudomxai Alternative Development Project (OADP); Oudomxai

   These projects will conduct pipeline sub-projects in a total of 14 districts.

3. Objectives

   To reduce and eliminate the production of illicit drug crops through specifically designed rural development measures in the context of sustained national growth.

   As mentioned above, the interventions to achieve this objective will also satisfy needs for achievement of the government's objectives in stabilization of shifting cultivation through development of sustainable sedentary framing systems and other off-farm income generating activities.

4. Project Description

   The Government's strategy calls for elimination of shifting cultivation by 2010 and elimination of opium poppy cultivation by 2006[3]. Recognizing that strategies for stabilization of shifting cultivation and elimination of opium poppy call for common interventions, the government's 5-year Socio-Economic Plan provides for these two programs to be conducted in parallel. A study of the on-going and planned programs, for stabilization of shifting cultivation and opium cultivation elimination, indicate that northern areas are receiving substantial attention from a range of projects and donor agency assistance. Consequently the Master Plan Study does not propose further initiatives in these areas.

   However, the United Nations International Drug Control Program (UNDCP) and the Lao National Commission for Drug Control and Supervision (LCDC) have proposed a major

[2] Annul Opium Poppy Survey 1999/2000 Lao Commission for Drug Control and Supervision, October 2000.
[3] Socio-Economic Development Strategy for 2020, 2010 and Five year's Socio-Economic Plan (2001-2005).

program including 6 area-based projects in northern upland areas, for which funding commitments have not yet been secured for each project. Details of this program are therefore included as proposals in this part of the Master Plan.

(The UNDCP and LCDC formulated program is entitled ***"A Balanced Approach to Opium Elimination in Lao PDR").***

The projects will provide interventions in prioritized target villages in 14 districts to facilitate community-based development leading to stabilized farming systems and increased family income. In addition to the six proposed projects, another 4 similar projects are ongoing in Louangnamtha, Oudomxai, Xiangkhouang and Houaphan.

The projects are formulated to provide a range of interventions for physical and social infrastructure, food security and income generation, community based drug demand reduction and law enforcement.

It is in the areas of physical and social infrastructure and food security and income generation where there is a commonality of interventions to achieve both goals. Here, a combination of development efforts including, improved access, health and education, sustainable farming systems with alternate cash crops and other income generating activities, provide for sustainable sedentary farming and other livelihood pursuits.

5. Project Components

(1) Physical infrastructures: - roads, water supply and sanitation and small-scale irrigation works utilizing community labor through cooperation with IFAD and other donors.

(2) Social Infrastructure: - gender responsive community development, health, education and vocational training.

(3) Food security and income generation including: - sustainable land-use development, livestock, forestry, eco-tourism, income diversification and credit.

6. Project Costs

The project cost is estimated at about US$ 33.8 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Total
Capital cost	1,590	5,406	5,406	5,406	5,406	5,406	28,620
Recurrent cost	764	878	878	878	878	878	5,154
Total	2,354	6,284	6,284	6,284	6,284	6,284	33,774

7. Implementing Agency

The Provincial Governments of each province.

8. Organizational and Staffing Requirements

No incremental staffing required. Theses will be implemented under the present organizational framework of the Provincial Government Offices in conjunction with PAFOs and the target DAFOs.

9. Implementation Schedule

The projects are to be mobilized in the period 2001-2006 as funds become committed and available. The need for follow-on activity to consolidate community self reliance and PAFS & DAFO capacity to provide ongoing extension assistance will need evaluation and review in the latter term of the program.

10. Lessons learnt and how to incorporate into the proposed projects

Lessons learnt from past projects and experience need to be incorporated during the detailed project design. The main considerations here are the design for participatory involvement of the target communities in the village development planning processes and the provision for on-farm research/extension liaison and application to problems and opportunities identified during the participatory planning processes.

11. Expected Benefits

(1) Elimination of opium supply and reduced drug abuse.

(2) Improved livelihoods of target communities.

(3) Reduced erosion and other environmental damage.

(4) Reduced exploitation of forest resources.

12. Assessment of Possible Problems and Bottlenecks in Implementation

Donor funding is delayed.

Staff with suitable qualification and experience cannot be assigned to project implementation.

13. Assessment of Natural and Social Environment

(1) Natural environment: Positive impacts through improved soil and water conservation, reduced burning and forest fires and lessened community dependence on forest resources.

(2) Social environment: Positive impacts through reduction in drug addiction and poverty and community participation in the development process.

14. Special Arrangements

Networking and coordination with the *Shifting Cultivation Stabilization Program, DoF,* will provide a linkage for information exchanges between these and other projects for stabilization of shifting cultivation.

Project No. SC-1.3

1. Title of Project / Program

   Upland Development and Poverty Alleviation Program

2. Location

   Possible provinces: Louangphrabang, Savannakhet and Xaignabouri.

3. Objectives

   To be defined. Expected objective to relate to promotion of balanced upland development through interventions addressing general development needs and targeted interventions to poorer, less entrepreneurial sections of the community.

4. Project Description

   (This project is currently being formulated and prepared for SIDA's consideration. The following outline represents current information and expectations).

   The program is being formulated as a development component to interface with the Lao-Swedish Agriculture & Forestry Research Program and to thereby provide for an upland development process as indicated in the *Strategic Vision.* The development process will involve: village based needs assessment and planning processes; demand driven extension; demand driven village-based on-farm adaptive research & development; market analysis and enterprise development support and eco-tourism development.

5. Project Components

   Expected to cover:

   a. Improved farming systems.
   b. Agro-forestry.
   c. Community forestry.
   d. Non-timber forest products.
   e. Livestock and fish.
   f. Cottage and medium-scale rural industry.

6. Project Costs

   The project cost is estimated at about US$ 7.5 million as shown in the table below.

   (Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
Capital cost	1,160	1,160	1,160	1,160	1,160	5,800
Recurrent cost	344	344	344	344	344	1,719
Total	1,504	1,504	1,504	1,504	1,504	7,519

7. Implementing Agency

   National leading agencies coordinated with provincial planning departments, districts and villages.

8. Organizational and Staffing Requirements

To be proposed by MAF. Expected to be proposed for implementation under the present organizational framework of the Provincial Government Offices in conjunction with PAFOs and the target DAFOs.

9. Implementation Schedule

The program is expected to be long term commencing in 2002/3, with reviews of progress to determine ongoing needs.

10. Lessons Learnt and How Incorporated into Proposed Project

Lessons learnt from past projects and experience need to be incorporated during the detailed project design. The main considerations here are design for participatory gender sensitive involvement of the target communities in the development processes and the provision for on-farm research/extension linkage for adaptive research. Technology solutions to land-use issues will be developed from study and understanding of indigenous systems.

In relation to poverty, it is seen from past experience that the poorer, less entrepreneurial and resource endowed sections of communities will need specific targeting in addition to working with the more progressive farmers, traders and rural industry sections of the community.

11. Expected Benefits

(1) Reduced poverty and improved livelihoods of target communities.

(2) Reduced erosion and other environmental damage.

(3) Reduced exploitation of forest resources.

12. Assessment of Possible Problems and Bottlenecks in Implementation

Staff of suitable qualification and experience cannot be assigned to project implementation.

13. Assessment of Natural and Social Environment

(1) Natural environment: Positive impacts through improved soil and water conservation, reduced community dependence on forest resources.

(2) Social environment: Positive impacts through reduction of poverty and gender balanced community participation on the development process.

14. Special Arrangements

Nil.

Project No. SC-2

1. Title of Project / Program

   Stabilization of Shifting Cultivation in National Biodiversity Conservation Areas (NBCAs).

2. Location

   Prioritized NBCAs which face threats from shifting cultivators.

   For assistance to this Master Plan Study the NBCAs have been reviewed to identify those currently facing a significant threat from shifting cultivation. These NBCAs were then further divided into those with, and without, on-going or planned projects to address the identified needs.

   On this basis additional planned project interventions are required and proposed for the ten (10) following NBCAs:

Phou Phanang	Vientiane Province / Vientiane M.
Nam Kading	Borikhamxai
Dong Phou Vieng	Savannakhet
Xe Sap	Saravan / Xekong
Dong Amphan	Attapu
Nam Xan	Houaphan
Nam Phoui	Sayaburi
Nakai Nam Theun	Khammouane / Borikhamxai
Phou Hin Poun	Khammouane
Xe Bang Nouan*	Saravan

   * Faces threats from villager accessing aquatic resources, livestock grazing & areas of cropped land.

3. Objectives

   To stabilize shifting cultivation and promote sustainable utilization of forest and other natural resources within the target NBCAs.

4. Project Description

   In 1993, the Prime Minister's Decree No. 164 established eighteen (18) National Biodiversity Areas. An additional two areas were added in 1994. Traditionally villagers in these areas have had access to the forest areas, which provide a large proportion of their subsistence needs. Some village communities are enclosed within the NBCA boundaries and practicing shifting cultivation, as well as relying heavily on forest products. Other villages bordering on NBCAs access and gather forest products, to supplement their subsistence livelihoods.

   The Forestry Law reconfirms the Government's commitment to participatory NBCA management by creating a framework for zoning within them into totally protected (TPZ) and controlled use (CUZ) zones. This is further elaborated by Article 42 which specifies

the rights of villagers to utilize CUZs for a variety of livelihood purposes. Article 63 further provides for the development of local regulations for the management and care of forests, watersheds, wildlife, and the natural environment by village authorities. Although not specifically stated, it is understood that CUZs are to be jointly managed by villagers with support from the government, while TPZs remain the direct responsibility of NBCA authorities.

The projects will work within a framework for devolved co-management of the NBCAs, as provided for under the law. This will be achieved through participatory action with villagers in developing sustainable livelihood and conservation strategies through a local partnership approach.

In the identified NBCAs there is a significant need for development of sustainable farming systems and sustainable management and utilization of NTFPs within agreed controlled use zones. In this regard, there are other projects working in proximity to the NBCAs in relation to stabilization of shifting cultivation and management and marketing of NTFPs. This provides opportunities for liaison and networking between such closely related projects for complementary benefits and acceleration of development progress.

5. Project Components

Participatory land-use planning and zoning.

Village development planning & extension.

Sustainable management & utilization of NTFPs.

Monitoring & evaluation.

Annual training to be conducted within each component - based on training needs assessment for work plan implementation. Human resource development training is addressed in other projects in the HRD sub-sector of the Master Plan Study.

6. Project Costs

For the period of 9 years, a budget frame of about US$ 2.6 million per NBCA is required as shown below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Capital cost	290	240	240	240	240	240	240	240	240	2,210
Recurrent cost	47	45	45	45	45	45	45	45	45	409
Total	337	285	285	285	285	285	285	285	285	2,619

A total of about US$ 26 million is required for the 10 identified NBCAs.

7. Implementing Agency

The Division Forest Resource Conservation DoF, and the relevant Provincial and District Agricultural & Forestry Services.

8. Organizational and Staffing Requirements

These projects will need to be implemented under the present organizational framework

for NBCAs and PAFS and DAFO staffing for NBCA and agricultural extension.

Team	Present Staff No.	Proposed Staff No.	Balance
NBCA Heads	9	9	0
District NBCA	30	30	0
PSMS – NTFPs	11	11	0
District extension	30	30	0
Total	70	70	0

Other Provincial and District staff resources will be required as appropriate to the village level activities such as during land-use planning and allocation in target districts and for specific livelihood development activities – small livestock, handicrafts etc.

9. Implementation Schedule

It is envisaged that projects would be prepared on the basis of 4 year first phase with a review in the 4th year to determine needs for the remaining 5 years, on an individual NBCA basis.

10. Lessons Learnt and How Incorporated into Proposed Project

Lessons learnt from past projects and experience need to be incorporated during the detailed project design. Main considerations here are the design for gender sensitive participatory involvement of the target communities in the village development planning processes and for determination of natural resource and conservation agreements. Gender issues and women's participation in community agreements, planning, implementation, monitoring and evaluation are very important due to their significant roles in accessing forest resources.

11. Expected Benefits

(1) Improved livelihoods of target communities.

(2) Sustainable access and benefits from forest resources.

(3) Enhanced protection of specified protected areas through community involvement.

12. Assessment of Possible Problems and Bottlenecks in Implementation

Staff of suitable qualifications and experience may not be assigned to project implementation.

13. Assessment of Natural and Social Environment

(1) Natural environment: Positive impacts through improved soil and water conservation, reduced community dependence on forest resources.

(2) Social environment: Positive impacts through reduction of poverty and community participation on the development process.

14. Special Arrangements

Nil.

Project No. SC-3

1. Title of Project / Program

   On-farm Agroforestry Adaptive Research for Sustainable Upland Farming Systems

2. Location

   Forest Research Center, NAFRI / Target PAFS / DAFOs, MAF .

   There are a range of projects being implemented, and others in the planning phase, that address stabilization of shifting cultivation through development of farming systems and other off-farm income generating activities.

   This project is proposed to work with selected ongoing and proposed projects and complement upland technology development in sustainable land-use systems.

3. Objectives

   To develop and establish area-based agro-forestry models of appropriate sustainable upland land-use based on biophysical and agro-climatic situation.

4. Project Description

   The government has recognized that population increase and restriction of access to forestland would have impact on the environment and upland livelihood systems. In response, it has developed strategies and programs to facilitate the stabilization of shifting cultivation. These strategies and programs recognize the need for participatory programs to enable upland communities to adapt to changes by developing sustainable farming/land-use systems and other related income generating activities.

   The objective of the government strategy is for community participation in development of sustainable sedentary production activities, which are non-hazardous to the environment. Sedentary livelihood systems, whilst they will remain diverse in nature, will involve intensified and permanent use of allocated agricultural land, as opposed to the more extensive traditional swidden rotation systems.

   Upland livelihood systems are very diverse and include crops, livestock and a large range of forest products. Traditionally these systems have relied on swidden cropping rotations for production of staple rice requirements. As populations have increased and access to forestland becomes constrained, the fallow period of swidden rotations has of necessity been shortened. Over the past 15 years fallow periods have been reduced from 10 –20 years to 3-5 years, as a result of these pressures.

   The fallow period is required to ameliorate soil physical condition, reduce weed population and replenish fertility that is depleted during the cropping phase. Under shortened fallow periods (less than 10 years) fertility and soil structure do not recover sufficiently for maintenance of productivity of the system. This sets off a chain of events leading to increasing poverty and increased pressure on non-timber forest products (NTFPs).

It is evident that many upland farmers are now caught in this vicious cycle of decreasing production and increasing poverty. Unless steps are taken, productivity will continue to decline presenting serious livelihood problems for communities in these areas. The surrounding forest areas will come under increasing pressure to supply more products and more farmland. Interventions are therefore vital to facilitate development and adoption of sustainable agro-forestry and other livelihood systems.

Whilst the statistics illustrate a significant reduction in shifting cultivation, the general experience in upland areas is that communities are not effecting commensurate changes in farming systems and improvements in productivity to maintain or increase living standards. Thus, there is a need for research and extension programs to provide assistance to upland communities in adapting their diverse livelihood systems.

This proposed project is to classify existing farming systems in the major upland agro-climatic zones. Following this, representative locations can be selected for participatory on-farm research and demonstrations to develop appropriate farming systems.

The research development approach will identify land capability and systems of farming for the various land classes within the upland areas. This will provide a menu of options for farming systems for livestock and crops incorporating soil conservation measures, crop rotations, improved forages, agro-forestry and other fallow enhancing practices. Improved systems of farming will reduce erosion and other environmental hazards to provide for sustainable production of upland rice and other crops.

5. Project Components

(1) Land Capability Classification and Land-use Planning

(2) Participatory development planning.

(3) On-farm research.

(4) Participatory monitoring & evaluation.

Training activities to be conducted within each component based on needs assessment (staff and villagers) for successful implementation of work plans. Human resource development training is addressed in proposed projects of the HRD sub-sector in the Master Plan Study.

6. Project Costs

For the project period of 9 years a budget frame of about US$ 3.7 million will be required as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Capital cost	340	240	240	240	240	240	240	240	240	2,260
Recurrent cost	165	162	162	162	162	162	162	162	162	1,458
Total	505	402	402	402	402	402	402	402	402	3,718

7. Implementing Agency

The Forest Research Center of NAFRI, MAF and the relevant PAFS & DAFO and target villages.

8. Organizational and Staffing Requirements

This project should be implemented under the present organizational framework with technical assistance through coordination and liaison with area based project staff. The project is be implemented by NAFRI as the lead agency in coordination and liaison with the SMS of the PAFS and the extension staff of the DAFOs.

Team	Present Staff No.	Proposed Staff No.	Balance
Coordinator	1	1	0
Agroforestry - NAFRI	2	2	0
Crops - NAFRI	2	2	0
Livestock - NAFRI	2	2	0
PSMS - 3 Prov.	3	3	0
DAFO Extn. - 6 Districts	2	2	0
Farmer Coop.- 12 Village	12	12	0
Total	24	24	0

9. Implementation Schedule

It is envisaged that the project would be prepared on the basis of 4 year Phase I to be extended to a Phase II (5 years) following a review in the 4th year.

10. Lessons Learnt and How Incorporated into Proposed Project

Lessons learnt from past projects and experience need to be incorporated during the detailed project design. Main considerations here are that improvements and changes to farming and livelihood systems need to commence from the current situation in target villages. This requires a gender responsive participatory study of indigenous systems. Adaptations that can be adopted and tested by villagers in a step-by-step fashion have proven more likely for farmer take up and further improvement during their adoption.

11. Expected Benefits

(1) Improved livelihoods of target communities.

(2) Reduced erosion and other environmental hazards.

(3) Reduced pressure on forest and other natural resources.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Staff of suitable qualifications and experience cannot be assigned to project implementation.

(2) Coordination of work programs and timetables between central, provincial and district staff.

13. Assessment of Natural and Social Environment

(1) Natural environment: Positive impacts through improved soil and water

conservation, reduced community dependence on forest resources.

(2) Social environment: Positive impacts through reduction of poverty and increased community self reliance through participation on the development process.

14. Special Arrangements

Nil.

Project No. SC-4

1. Title of Project / Program

   Research Project on Sustainable Management and Utilization of NTFPs.

2. Location

   To be coordinated at the central level by the NTFP Research Division, FRC of NAFRI, and implemented by the 3 NTFP Support Centers in Oudomxai, Saravan and Champasak.

3. Objectives

   To develop and promote sustainable harvesting management and utilization of NTFPs.

4. Project Description

   As population increases in the uplands, and access to forestland is restricted, the productivity of shifting cultivation farming systems is declining, due to shortening of the swidden rotations. In response, upland families increase gathering of NTFPs, which have traditionally formed a significant part of their subsistence requirements. NTFP exploitation is now occurring on a vast scale by local communities for subsistence requirements. If this trend is to be reversed it is imperative that management and institutional frameworks for sustainable utilization of NTFPs be developed.

   The government has recognized these major changes and impacts on the environment and livelihood systems. In response it has developed strategies and programs to facilitate the stabilization of shifting cultivation through development of sedentary livelihood systems with sustainable farming systems and development of off-farm income sources. Sedentary livelihood systems will remain diverse in nature and must address the sustainable utilization and management of NTFPs, which form a large part of upland family potential sustenance and income generation sources.

   Project activity to develop a knowledge base of the NTFP sub-sector commenced in the early 1990s. A major project has been the IUCN/NTFP Project, which commenced in 1995. It was implemented by the Department of Forestry and is now integrated into the NTFP Research Division of the Forest Research Center, NAFRI. This project established field NTFP Support Units in Oudomxai, Salavan and Champasak provinces. It has made an exemplary start on understanding a range of key NTFPs and developing practical methods of controlled harvesting and management of some selected NTFPs. These Support Units are now extending their findings to neighbouring provinces. This new project will build on the previous work and provide needed information on management and utilization of key NTFPs for extension through PAFS/SMS to the DAFOs.

   The IUCN/NTFP Project commenced in 1995 and will finish in September 2001. It has commenced to provide valuable information in relation to the importance and range of NTFPs and detailed information on a number of key NTFPs. The range of NTFPs is extremely diverse, from basic forest foods to oils and extracts for highly valued perfumes and herbal medicines. This large and valuable area needs more detailed study in

undertaking inventories and to detail methods for sustainable management within forest situations. The project will also assess the potential for domestication and management of some NTFP species.

Work on NTFPs must be continued in close cooperation with the communities accessing and relying on them for sustenance and income generation. Much of the current knowledge is held within these communities and they are the ones most capable of managing and controlling harvest methods, intensities and other management practices required for maximizing benefits from NTFPs.

Management principles for sustainable benefits from NTFPs will be tested and applied in a limited number of target areas. As information and experience becomes consolidated. gradual expansion to regional levels will occur. Such an approach will allow the GoL to develop and implement policies and management regimes that foster sustainable benefits. A related project No. M-9, in the Marketing sub-sector of this Master Planning Study, addresses processing and marketing development needs in relation to the NTFP sub-sector. Part of that project's work is to address policy, legal and procedural requirements related to the sub-sector.

5. Project Components

(1) NTFP Inventories development.
(2) NTFP Utilization & Management.
(3) NTFP Domestication.
(4) Monitoring & evaluation.

Training activities to be conducted within each component based on needs assessment (staff and villagers) for successful implementation of work plans. Human resource development training is addressed in other proposed projects in the HRD sub-sector of the Master Plan Study.

6. Project Costs

For the project period of 9 years a budget frame of about US$ 9.2 million will be required as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Capital cost	915	780	780	780	780	780	780	780	780	7,155
Recurrent cost	233	229	229	229	229	229	229	229	229	2,069
Total	1,148	1,009	1,009	1,009	1,009	1,009	1,009	1,009	1,009	9,224

7. Implementing Agency

NTFP Research Division of the Forest Research Center, NAFRI, MAF and the relevant PAFS & DAFO and target villages.

8. Organizational and Staffing Requirements

The NTFP Unit, FRC of NAFRI, will coordinate implementation through the NTFPs Support Units of the PAFS. These units will work closely in conjunction with target

district extension staff and village cooperator groups. This structure has been developed by the IUCN/ NTFP Project that will finish in September 2001.

Team	Present Staff No.	Proposed Staff No.	Balance
NTFP Unit NAFRI	8	8	0
NTFP Support Unit – Champasak	9	9	0
NTFP Support Unit – Saravan	10	10	0
NTFP Support Unit – Oudomxai	10	10	0
DAFO Extension - 9 Districts	18	18	0
Farmer Cooperator Groups	100	100	0
Total	155	155	0

9. Implementation Schedule

It is envisaged that the project would be prepared on the basis of 4 year Phase I to be extended to Phase II (5 years) following review in the 4th year.

10. Lessons Learnt and How Incorporated into Proposed Project

Lessons learnt from past projects and experience need to be incorporated during the detailed project design. Of particular importance is the recognition that the diversity of NTFPs requires multiple, locally developed solutions. These solutions need to be generated in a framework of gender responsive participatory group work with networking between neighboring village communities. This framework requires an active support network to facilitate and accelerate information and experience interchanges.

11. Expected Benefits

(1) Progress in stabilization of shifting cultivation through alternative income.

(2) Improved income and livelihoods of target communities.

(3) Sustainable development and production of NTFPs.

(4) Increased foreign exchange earnings from increased exports.

12. Assessment of Possible Problems and Bottlenecks in Implementation

Expected to be minimal, as much experience in operation has been achieved in past work.

13. Assessment of Natural and Social Environment

(1) Natural environment: Positive impacts through enhanced management and conservation of non-timber forest products.

(2) Social environment: Positive impacts through reduction of poverty and increased community self reliance through participation on the development process.

14. Special Arrangements

Nil.

7. Marketing and Agro-processing

Project No. MR-2

1. Title of Project/Program

   Agricultural Commodity Market Intelligence Project

2. Location

   Nationwide. However, due to need for all country coverage, initially only some provinces would be covered as follows:

   (1) Phase 1 (2000-2002): Vientiane Municipality and eight provinces, i.e. Vientiane, Khammouan, Savannakhet, Champasak, Louangphrabang, Houaphan, Xaignabouri and Louangnamtha. These provinces are being covered by the ongoing project of Market Information and Extension Project (FAO assistance).

   (2) Phase 2 (5 years after Phase 1 above): All 18 provinces (including the above eight provinces and Vientiane Municipality) in Lao PDR.

3. Objectives

   (1) To collect and disseminate commodity market information on output and input prices and production on a standardized and product differentiated basis so as to benefit producers, traders and consumers as well as other operators involved in transport, storage and processing of agricultural commodities;

   (2) To make available data on marketing channels for major commodities, the market structure performance and the volume of commodity flows from production to consumer areas; and

   (3) To provide data to the agribusiness sector participants on the seasonality of production, the market flows and the price determination process throughout the production cycle.

4. Project/Program Description

   With NEM and the market economy since the mid eighties, trade in agricultural commodities has been increasingly determined by market forces. According to the results of the Principal Components Analysis (PCA) made under this study, the market orientation is considerably high in and around Vientiane Municipality and in the Bolaven plateau in Champasak province. A variety of vegetables is intensively produced for both the urban markets of Lao PDR and international markets. With the steady and increasing trend towards greater market orientation, there is a need for an improved system of market intelligence. This would in the short run assist producers, agro-processors, traders and consumers to be better equipped to make informed decisions on where and when to sell. It would also provide producers with a better basis for price negotiations with traders and explore the possibility of group selling to enhance bargaining position. In the long run, provision of timely market information would assist market operators including producers and consumers with the ability to diversify production, provide more flexibility in production decisions and adjust production and production practices to meet the demands

of the buyer, whether it is a consumer, processor or trader.

Recognizing the importance of marketing information dissemination to the farmers, the Government started the new project of Development of Market Information Marketing Extension Capability under the assistance from FAO in September 2000. This project costs US$ 271,000 for the period of 1.5 year with the following components.

Project Components of Development of Market Information Marketing Extension Capability

Component	Cost (US$)	Remark
Technical Assistance	115,766	International expert, National expert, Advisory Technical Services, etc.
Internal Travel	12,000	For research and training
Equipment	75,500	Vehicle, motorcycles, computers, etc.
Training	27,000	5-day seminar for MIS data collections, 2-week training for 18 marketing SMSs, etc.
Materials and supplies	8,000	
General Operating Expenses	12,734	
Direct Operating Expenses	20,000	
Total	271,000	

The expected project outputs are as follows:

(1) A detailed study/survey of agricultural marketing systems within Lao PDR as well as significant cross-border trade as a basis for (i) developing MAF's understanding of agricultural marketing in the country, and (ii) developing proposals for a MIS to be operated by MAF.

(2) A detailed outline, fully agreed to by all interested parties, of an operational MIS, specifying crops and locations to be covered, together with frequency of data collection and dissemination,

(3) A functioning MIS on a pilot scale, with necessary computer equipment and software installed and staff fully trained,

(4) Provincial SMSs in marketing having completed a 2-week training course in marketing and post-harvest handling,

(5) All extension staff in Champasak province having completed a 3-day training course in agricultural marketing,

(6) Training materials suitable for use in the training of extension workers in the other 17 provinces developed,

(7) An outline proposal for further technical assistance to strengthen the capacity of MAF to support farmers to undertake market-oriented production developed.

The proposed project of Agricultural Commodity Market Intelligence is defined as the Phase 2 of the above-mentioned ongoing project. An important element of Phase 2 is that it would run concurrently with the Product Grades and Classification System Project that is also scheduled for implementation in 2003. The information gathered from the Product Grades and Classification System Project is vital for the formulation of the commodities selected and the product standardization and classification system employed so that clear and unambiguous market information on price, volume and market flows is provided so

as to benefit the users.

This project will be implemented undertaking all the outputs from the ongoing project. Although it is very difficult to formulate the Phase 2 project at this stage, because the final outputs from the ongoing project will be available in February 2002, the feature of the proposed project is envisaged as follows:

(1) Market information on commodity prices and volumes on a clearly agreed product grade and classification system will be collected in major markets (including cross-border trade information) in all 18 provinces including Vientiane Municipality. The trained SMS (Marketing Officers) by the ongoing project will take responsibility for collection and recording of the data.

(2) All collected information will be sent to the Economics and Marketing Unit (EMU) of MAF. Communication networks between the EMU and the provincial Units would be improved to ensure timeliness of the information. This would be the case especially in remote provinces and in rapidly expanding production areas. In addition, EMU will collect market information in the neighboring countries. Wherever possible extensive use would be made of the Internet. The collected information will be complied and broadcasted from the radio stations operated in provinces where this facility is available.

(3) Establishment of provincial EMU will thus be needed under PAFSO in all provinces that have access to local radio stations.

(4) The central EMU will also prepare so-called Market Information Report on bimonthly basis. The report will present analytical results of commodity market information including grade and quality, seasonal price trends by major production areas, price trends in major markets and at borders, export volume trend of major commodities, etc.

(5) Technical assistance will be provided continuously by the project for smooth MIS operation, review and evaluation, possibility of MIS expansion and its implementation, staff training and monitoring and evaluation of the project.

5. Project Components

(1) Technical assistance for MIS operation and study on further expansion of MIS to other provinces to make the MIS a national program for the benefit of Lao PDR as a whole,

(2) Training of provincial EMU staff and refreshment course for SMSs and central EMU staff,

(3) General and direct operating expenses, and

(4) MIS operation equipment that includes renewal of 5 computer systems provided by the ongoing project and additional 2 computer systems for MIS expansion,

6. Project Costs

Phase 1; US$ 0.27 Million (ongoing project)

Phase 2: US$ 1.92 Million as shown in the table below:

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
Capital cost	300	280	240	240	240	1,300
Recurrent Cost	205	153	121	69	69	616
Total	505	433	361	309	309	1,916

7. Implementing Agency

Economics and Marketing Unit (EMU) of MAF,

In the Government's Strategic Vision, it is proposed to establish EMU within the Department of Agriculture.

Coordination linkage will have to be established with the Ministry of Commerce & Tourism, National Statistical Center, and Bank of Lao PDR, since these organizations are collecting price information for their specific use, e.g. consumer price index estimates make by Bank of Lao PDR.

8. Organizational and Staffing Requirements

The staffing requirements are estimated as follows:

Staffing Requirement of the Project

Province	Present Staff No. (Phase 1)	Proposed Staff No. (Phase 2)
1. Central EMU	7	7
2. Champasak EMU	3	3
3. Savannakhet EMU	0	3
4. Louangphrabang EMU	0	3
5. Marketing SMSs in 10 provinces	10	18
Total	20	34

9. Implementation Schedule

The proposed project will be implemented after the completion of ongoing project (Development of Market Information Marketing Extension Capability) as the Phase 2 implementation.

10. Lessons Learnt and How Incorporated into Proposed Project

As this is a new activity, lessons learnt from the current FAO project would be incorporated in to Phase 2. However, such lessons would have to await the evaluation of the current FAO project.

11. Expected Benefit

(1) Regular market information reports through radio bulletins and media,

(2) More market-oriented production,

(3) More competitive and transparent market transactions,

(4) Smoother supply adjustment, and

(5) Better public understanding of the market economy.

12. Assessment of Possible Problems and Bottlenecks in Implementation

Shortage of capable staff will prevent the project progress, if the Government could not assign required staff.

13. Assessment of Natural and Social Environment

(1) Natural environment: No direct negative impacts are expected. Indirectly, however, increase use of chemical fertilizers and ago-chemicals for the production of commodity crops would have impacts on natural environment particularly on land and water.

(2) Social environment: It is possible that income differentials between farmers could widen as a result of farmers who have potential to utilize the market information and those who do not avail of this potential.

14. Special Arrangements

(1) This profile has to be reviewed and updated based on the outputs from the ongoing project of Development of Market Information Marketing Extension Capability.

(2) The Government has to make further efforts on the road network development including rural roads so as to accelerate the development of market-oriented agriculture.

TERMS OF REFERENCE

FOR

THE AGRICULTURAL COMMODITY MARKET INTELLIGENCE PROJECT

IN

THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

1. Background and Justification

The need to establish a market intelligence system for the agricultural commodities in Lao PDR was identified as a priority to boost agricultural production within the progressive areas located near Vientiane Municipality, along the Mekong Corridor and along the northern areas bordering China and Vietnam. A project profile for the Agricultural Commodity Intelligence Project was elaborated with the objectives; (i) to collect and disseminate commodity market information on output and input prices and production on a standardized and product differentiated basis so as to benefit producers, traders and consumers as well as other operators involved in transport, storage and processing of agricultural commodities; (ii) to make available data on marketing channels for major commodities, the market structure performance and the volume of commodity flows from production to consumer areas; and (iii) to provide data to the agribusiness sector participants on the seasonal of production, the market flows and the price determination process throughout the production cycle.

Under the Master Plan Study on Integrated Agricultural Development in Lao PDR a Market Study on Agriculture and Fisheries Products was conducted to assess the present market conditions in 5 provinces. The study gave additional information on the market structures and channels from producers to retailers and consumers. The market study also stressed the need to elaborate a marketing information system for the agriculture sector.

FAO also conducted a similar study with the focus to study the marketing system as well as significant border trade in Lao PDR, to develop MAF's understanding of agricultural marketing in the country and to develop proposals for a Market Information System to be operated by MAF.

The proposed project will be the continuation and consolidation of the work undertaken in the course of the two studies as specified above. The project will be implemented by the Ministry of Agriculture and Forestry (MAF) with the technical assistance specified in the following paragraphs.

2. Objective of the Technical Assistance

The Technical Assistance aims to support the establishment of a Market Intelligence System (MIS) by providing technical advisory work for the collection and dissemination of market information, for setting up data information system on the marketing structures and channels of major agricultural commodities, and for setting up marketing information system that will help farmers in production and sales.

The Technical Assistance would also provide necessary support in term of management during the preparation, implementation and evaluation of the project. At the completion of the project, the technical assistance should be able to present important lessons learned and sound recommendations for fine tuning the project's strategic approach, implementation design and feature to sustain the follow-up or replication of the development objectives and activities after the completion of the project.

3. Scope of Work

In order to set up the MIS on a sound footing, the technical assistance will conduct an in-depth study of the domestic marketing system by studying the previous survey made by JICA and FAO. The study shall cover the remaining provinces, which was not covered by the said studies.

In addition, a study of the Lao PDR actual and potential export of agricultural products and sources of international market information will be conducted at the initial stage of the project.

Following the findings and recommendations of past and on-going projects and on the new data and information provided through the additional study specified above, the technical assistance will elaborate an implementation strategy for MIS and field test the MIS model in selected provinces. It is recommended to use the 8 provinces surveyed under the FAO project.

The technical assistance will assure the well operation of the MIS and will establish the necessary steps to further expand the MIS model to other provinces and establish a nation wide MIS system to benefit Lao PDR as a whole.

The Technical Assistance will ensure the well functioning of the project and the capacity building through development of skills and knowledge through training of government staff and farmers.

4. Specific Tasks

Pursuing the scope of work defined above, the technical assistance will follow the specific tasks for each main project components as below.

(1) In-depth study of the domestic marketing system.

- To survey and review domestic marketing system and channels
- To survey and review major domestic trade flow
- To survey and review commodity price and demand structure of commodities
- To review laws and regulations on marketing
- To survey and review present market structure and infrastructure
- To review present marketing information system.

(2) Study of the Lao PDR actual and potential export of agricultural product and sources of international market information.

- To survey and review marketing system and channels of export commodities.
- To survey and review major export trade flow
- To survey and review commodity price and demand structure of export commodities
- To review laws and regulations on exportation of commodities including the impact of Asian Free Trade Area (AFTA) to the export of Lao agricultural commodities.
- To review present marketing information systems for export commodity and source of international information available.

(3) Elaboration and implementation of MIS model.

- To establish Economic Marketing Unit (EMU) and communication network between the EMU, provincial and district marketing information unit, and farmers.
- To establish sample/model classification, sorting/grading and packaging of products.
- To establish market information collection on commodity prices and volumes at provincial and district markets in 8 provinces.
- To analyze seasonal market trends and give advise on production and sales to producers.
- To establish provincial and district EMU radio/TV bulletins and news paper bulletins.
- To transfer knowledge to the EMU staff and farmers through formal training and on the job training.

(4) Expand the MIS model to other provinces and establish a nation wide MIS system.

- To disseminate the lessons learned from the implementation of the MIS model to other provinces through seminar and technical meeting.
- To replicate the MIS model and network in 10 remaining provinces.

(5) Project operation, monitoring and evaluation.

A project operation, monitoring and evaluation system, which involve capacity building of the local institution will be elaborated for implementation of the project. The technical assistance task will be:

- To ensure that outputs, outcomes and impacts emerging at each steps of the project implementation have been realized towards achieving the implementation progress and development objectives. Therefore, proper monitoring and evaluation will be conducted in relevance with the scope and work schedule of the project.
- To ensure the correct utilization of project funds including those from the local

contribution through the implementation of the Project's Financial Regulations.

- To ensure the correct operation and utilization of project's facilities, equipment and materials during the overall duration of the project.

Assistance to the overall project management by the team leader will be:

- To assist the Project Director/Coordinator in the overall project management and coordination among government agencies.
- To assist the Project Director/Coordinator for the preparation of annual implementation program and budget arrangement.
- To assist the Project Director/Coordinator for monitoring the work progress of each sub-project components.
- To assist the Project Director/Coordinator for the preparation of regular progress reports.

(6) Reporting

The following reports shall be prepared and provided.

(a) Inception report

To be submitted by the end of the third month after the commencement of the technical assistance services. The report will contains overall work schedule, work plan, administrative arrangement, results the review of existing data/ information during the inception period.

(b) Monthly progress report

To be submitted at a monthly interval, which contains mobilization reports, man-months consumed, summary of work progress during the reporting month, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next month.

(c) Quarterly progress report

To be submitted at three month interval, which gives a summary of the consultant's activities, work progress during the reporting period, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next quarterly period.

(d) Annual report

To be submitted at the annual assignment, which gives a summary of the consultant's activities, work progress during the reporting period, problems encountered and its solutions, deviation from the original work schedule, and anticipated services, program and schedule of works for the next year.

(e) Completion report.

To be submitted, upon completion of all services, giving all aspects related to the project management and the project works.

(f) Project management formulation report

To be prepared for reporting the current formulation status of the project management. The report will comprise of a summary of the project management system and implementation, including guideline with checklist for sub-project identification and reporting format.

(g) Specific technical reports

After the completion of each long term and/or short term assignment each individual expert will submit his/her individual technical report/note on the technical support implemented and accomplished during the period assigned to work with the project.

In addition to the individual technical reports, the following technical report will be provided as result of technical group work.

- Lao PDR Domestic Marketing System of Agricultural Commodity Study Report
- Lao PDR Actual and Potential Export of Agricultural Commodity and Sources of International Market Information
- Agricultural Marketing and Marketing Information System in Lao PDR.

5. Expertise Requirements

A team of consultants, which may be and academic or research organization, or and independent consulting firm, will be engaged to undertake the consulting services as specified above. This would include international, regional and local expertise in following.

(1) Team Leader Institutional Marketing Specialist (International) for a total of 36 man/months to assist in the design, establishment and implementation of EMU and information network.

(2) Agricultural Marketing Specialist (International) for a total of 9 man/month to assist in the survey, review and analysis of the domestic marketing system and of potential export of agricultural commodity.

(3) Market Information Service Specialist (International) for a total of 6 man/month to assist in the establishment of MIS including price and volume collection system, market analysis system and radio/TV/newspaper broadcasting and publications.

(4) Agricultural Commodity Grading Specialist (International) for a total of 3 man/month to assist in the development of market data information based on classification grading/packaging for the MIS.

(5) Marketing Training and Extension Specialist (regional) for a total of 30 man/month

to assist in the design and elaboration of necessary training and in the implementation of the MIS.

(6) Marketing Training and Extension Specialist (MT&E) (3 Local) for a total of 126 man/month to assist in the design and elaboration of necessary training and in the implementation of the MIS. The 3 MT&E experts will be located at the Regional Agriculture Forestry Extension Training Centers (RAFECTs).

(7) Unspecified Backstopping Expertise to be specified in the current of the project implementation. This will include 3 man/month international, 3 man/month regional and 6 man/month local.

6. Time Frame

The time frame of the project as well as of the technical assistance is of 5 years. The following time frame is tentatively proposed for the mandate of the consultant team.

	Time Frame	m/m	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
1	**International**													
	Team Leader / Institutional Marketing	36												
	Agriculture Marketing	9												
	Market Information Service	6												
	Agricultural Commodity Grading	3												
2	**Regional**													
	Marketing Training and Extension	30												
3	**Local**													
	Marketing Training and Extension Northern	42												
	Marketing Training and Extension Central	42												
	Marketing Training and Extension Southern	42												
4	**Unspecified Backstopping Expert**													
	International	3												
	Regional	3												
	Local	6												

Project No. MR-4

1. Title of Project/Program

   Agricultural Products Grade and Classification Project

2. Location

   Nationwide

3. Objectives

   The objective of the project is to 1) develop a system of grades and classification for agricultural commodities that are widely accepted by producers, traders, and consumers, both domestically and internationally; 2) facilitate trade and commerce through sight unseen trading; 3) assist in standardization of transport, packaging, cold storage and processing; 4) expand domestic and international trade.

4. Project/Program Description

   The project would design grade standards and classification for a select group of important agricultural commodities, including livestock products. At present, the trade recognizes simplified grade standards for rice and meat products. However, grade standards should be designed to assist producers, processors, traders and consumers in making market and price decisions. They should reflect commodity characteristics that buyers recognize and desire. Grades and standards should also be prepared bearing in mind the demand characteristics of specific commodities in neighboring countries for major traded commodities such as coffee from the Boloven Plateau.

   Based on commodity characteristics of buyers, both domestic and foreign, grade standards would be developed under the proposed project for major agricultural commodities. This should involve detailed preference surveys containing product preference and attributes of buyers, consumers and processors.

5. Project Components

   (1) Studies and surveys, including surveys of product characteristics and attributes valued by consumers, processors and wholesalers. This would involve studies and surveys at different points on the marketing chain from farm gate to consumer. It would also include inclusion of product attributes such as shelf life, retention qualities of color, appearance and taste. The grade system for livestock products such as milk and meat is relatively easier as there are universally accepted characteristics of grading. For milk these are fat content, additives such as water and temperature for storage. For meat the standard grading standards apply both to carcasses and to meat on the bone. Fat content and appearance are important. The studies should also cover the commodity characteristics that buyers in neighboring countries or what the border trade presently demand and value. This would involve extending the study to evaluate the grading systems in Thailand and the preferences of buyers and consumers in neighboring countries as this has an important bearing on potential for exports,

especially with the move towards free trade under AFTA.

(2) Selection of important commodities and pilot testing of grade and classification systems to ensure that they consist of attributes in demand by the users and how these attributes relate to price decisions in the marketplace as well as foreign buyers;

(3) Organization for inspection, and implementation of the grade system

(4) A training program for staff administering the system

(5) Monitoring and evaluation of the grades and classification system.

6. Project Costs

The project cost is estimated at about US$ 740,000 as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Total
Capital cost	226	226	128	580
Recurrent Cost	49	90	24	164
Total	275	316	152	744

7. Implementing Agency

MAF Planning Division with cooperation of DOA and DLF

8. Organizational and Staffing Requirements

2 additional staff per year beginning on commencement of the grade and classification system for monitoring.

9. Implementation Schedule

The study and survey work could commence in 2003 and on completion of studies and pilot testing the scheme could be introduced in 2005. The monitoring should continue thereafter as the grade standards need to be frequently reviewed to keep them in line with changing buyer tastes and demands as well as conditions of production. Grade and classifications should be subject to regulations rather than detailed specifications by legislation.

10. Lessons Learnt

Lessons from having simplified grades for meat and rice indicate that there are advantages in having a grading system as due to economies in packaging, transport and cold storage through standardization. It also promotes trade as buyers know what they get for a specified grade.

11. Expected Benefit

(1) The quality of crop products and market reliance are improved.

(2) As result of the above, income of farmers is enhanced through price increase of crop products.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    (1) Shortage of government counterpart budget for operation and maintenance cost of the Inspection Unit, but this is likely to be small, as only two staff are required

13. Assessment of Natural and Social Environment

    (1) Natural environment: No direct negative impacts are expected.

    (2) Social environment: It is possible that income differentials between farmers could widen as a result of farmers who can access the knowledge on grade of crop products and those who can not access it.

14. Special Arrangements

    None

Project No. MR-7

1. Title of Project/Program

   Study of the Export Potential and Input Imports of Agricultural Commodities

2. Location

   Nation-wide, and neighboring countries (China, Thailand, Vietnam, Singapore, Cambodia, Myanmar).

3. Objectives

   To study marketing opportunities for export/import of agricultural commodities.

4. Project/Program Description

   Economic liberalization started in 1986 by the implementation of the New Economic Mechanism and rural communes operated under the centrally controlled economy were dissolved completely in 1988. However, agricultural productivity in the country has not much improved. A huge volume of agricultural products is still imported from Thailand and Vietnam legally and illegally. The export of agricultural products is small, even though there is considerable under-utilized land, and human and water resources. Farmers sometimes have to buy expensive imported fertilizers, chemicals, fingerlings, feed, seeds and other farm inputs due to regulations and other reasons. There is much paper work and time required for approval of export and import of agricultural commodities.

   To address marketing problems, in September 2000 FAO started the project named Development of Market Information and Marketing Extension Capability. JICA also started a Marketing Study of Agricultural and Fisheries Products in Lao PDR in September 2000. These studies are comprehensive covering the main agricultural commodities and production /consumption areas, but lack information of potential foreign markets for import/export of agricultural commodities from countries such as Thailand, Vietnam, China and Singapore.

5. Project Components

   The project activities will be as follows:

   (1) To review the FAO and JICA marketing Studies.

   (2) To study the agricultural marketing conditions in the target countries in the following aspects:
   - General agricultural marketing conditions for the main agricultural commodities,
   - Marketing channels for the main agricultural commodities,
   - Import/export restrictions for the main agricultural commodities,
   - Packing, freight and quarantine requirements,
   - Marketing positions and SWOT analysis of respective Lao products,
   - Consumption characteristics of each agricultural product in the target countries,

- Market demand characteristics, product specifications and sources of supply,
- Import/ export of the main agricultural commodities,
- Seasonal price fluctuations of the main agricultural commodities.

(3) To conduct test marketing of selected Lao products with market potential and to analyze the results.

(4) To improve the capabilities of government officers through training in marketing.

(5) To exchange of views and information through field trips and seminars with other development projects, institutions and extension organizations related to agricultural marketing.

(6) To make a strategic master plan to improve the export/import of agricultural commodities.

6. Project Costs

This proposed study would require the cost of about US$ 592,000 as shown below.

(Unit: US$ 1000)

	Yr 1	Total
Capital cost	564	564
Recurrent Cost	28	28
Total	592	592

7. Implementing Agency

The Department of Agriculture (DOA) of the Ministry of Agriculture and Forestry (MAF)

8. Organizational and Staffing Requirements

This program will be implemented under the present organizational framework of the government. An Economic and Marketing Unit, which will be established in the Department of Agriculture will be responsible.

9. Implementation Schedule

The program will be implemented within 6 months.

10. Lessons Learnt and How to Incorporate them into the Proposed Project

This is not applicable as there have been no substantial agricultural marketing studies in Laos.

11. Expected Benefit

(1) Substantial amount of agricultural products will be exported resulting in improving the balance of payment as well as improving the livelihood of the farmers.

(2) Farmers will be able to buy cheaper and quality farm inputs from abroad when required resulting in productivity improvement.

(3) Information and market intelligence concerning foreign marketing of agricultural commodities by government officers will be improved.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    (1) There may be some difficulty in obtaining information on the border trade from the provincial governments, custom and tariff revenues in particular.

    (2) Some countries such as Thailand have marketing syndicates. Collection of the marketing conditions might meet with some difficulties.

13. Assessment of Natural and Social Environment

    (1) Natural environment: No impact is expected.

    (2) Social environment: There should be a positive impact through increased and sustainable crop yields.

14. Special Arrangements

    None

Project No. MR-8

1. Title of Project / Program

   Processing and Marketing of Non Timber Forest Products (NTFPs)

2. Location

   Coordinated centrally level by the NTFP Division, FRC of NAFRI and implemented through three NTFP Support Centers in Oudomxai, Saravan and Champasak provinces.

3. Objectives

   (1) To identify key NTFPs and develop market knowledge and improved marketing strategies and guidelines.

   (2) Undertake pilot testing based on developed guidelines.

   (3) To identify processing opportunities and provide recommendations to guide development of the processing sector.

4. Project Description

   The GoL as a national priority has identified the development of the NTFP sub-sector in recognition of its potential to generate significant villager and national income.

   Project activities to develop the NTFP sector commenced in the early 1990s. A major initiative has been the IUCN/NTFP Project which was implemented by the Department of Forestry and is now integrated into the NTFP Research Division of the Forest Research Center, NAFRI. The project established field NTFP Support Units in Oudomxai, Saravan and Champasak provinces. Project work and results made an exemplary start in developing an understanding of a range of NTFPs and practical methods of controlled harvesting and management. The paramount importance of community participation in the process was highlighted. These Support Units are now extending findings to neighboring provinces.

   This large and potentially immensely valuable resource pool requires more work and detailed study and development to identify market opportunities, value added processing options and marketing mechanisms to increase returns to families and the nation. This project will build on previous work providing necessary information on the management and utilization of key NTFPs for extension through PAFS/SMS support to the DAFOs.

   In the first 5-year period, the steps required are: -

   (1) Identification of target NTFPs for focused attention.

   (2) Identification where processing and/or marketing capabilities requires developing or strengthening and providing guidelines, including on-the-job training for local artisans.

   (3) Undertaking marketing surveys and trials including an evaluation of legal and procedural impediments with recommendations to overcome these impediments.

(4) Undertaking market expansion where a potential has been identified within an assessed harvesting capacity at identified sites.

(5) Monitoring and evaluating the environmental and socio-economic impacts.

(6) Preparation of a proposal for the required project components and assistance for the period 2006-2010.

Work in the field of NTFPs has to be conducted in close cooperation with the communities accessing and relying on them for sustenance and income generation. Much of the current knowledge is held within these communities and they are the ones who can most capably define problems, identify opportunities and participate in developing and testing alternatives. Each NTFP Support Unit should work initially with three districts in 5-6 villages.

5. Project Components – All 3 Support Units.

(1) Processing

(2) Marketing

(3) Training

(4) Monitoring & Evaluation

These project components will be integrated with components of the project proposal SC–4 for Research Project on Sustainable Management and Utilization of NTFPs. Components of this related project are: - NTFP Inventories Development; NTFP Utilization & Management; NTFP Domestication and Monitoring & evaluation.

Training activities to be conducted within each component based on needs assessment (staff and villagers) for successful implementation of work plans. Human resource development training is addressed in other proposed projects in the HRD sub-sector of the Master Plan Study.

6. Project Costs

The project cost is estimated at about US$ 2.1 million as shown in the table below.

(Unit: US$ 1000)

	Phase I			Phase II			Phase III			Total
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	
Capital cost	255	165	165	150	150	150	150	150	150	1,485
Recurrent Cost	69	67	67	66	66	66	66	66	66	601
Total	324	232	232	216	216	216	216	216	216	2,086

7. Implementing Agency

NTFP Research Division of the Forest Research Center, NAFRI, MAF and the relevant PAFS & DAFO and target villages.

8. Organizational and Staffing Requirements

The NTFP Research Unit, FRC of NAFRI, will coordinate implementation through the NTFP Support Units of the PAFS. These units will work closely in conjunction with target district extension staff and village cooperator groups. This structure has been developed by the IUCN/ NTFP Project that will finish in September 2001.

Team	Present Staff No.	Proposed Staff No.	Balance
NTFP Unit NAFRI	8	8	0
NTFP Support Unit – Champasak	9	9	0
NTFP Support Unit – Saravan	10	10	0
NTFP Support Unit – Oudomxai	10	10	0
DAFO Extension - 9 Districts	18	18	0
Farmer Cooperator Groups	100	100	0
Total	155	155	0

Other Provincial and District staff resources will be required as appropriate to the village level activities.

9. Implementation Schedule

The project would be implemented for nine-year period by dividing this period into three phases.

10. Lessons Learnt and How Incorporated into Proposed Project

Lessons learnt from past projects and experience need to be incorporated during the detailed project design. Of particular importance is the recognition that the diversity of NTFPs requires multiple, locally developed solutions. These solutions need to be generated in a framework of gender responsive participatory group work with networking between neighboring village communities. This framework requires an active support network to facilitate and accelerate information and experience interchanges.

11. Expected Benefits

(1) Progress in stabilization of shifting cultivation through alternative income.

(2) Improved family income and livelihoods of target communities.

(3) Increased foreign exchange earnings from increased product income.

12. Assessment of Possible Problems and Bottlenecks in Implementation

Expected to be minimal, as much good experience in operation has been achieved in past work.

13. Assessment of Natural and Social Environment

(1) Natural environment: Positive impacts through enhanced management and conservation of NTFPs.

(2) Social environment: Positive impacts through reduction of poverty and increased community self reliance through participation on the development process.

14. Special Arrangements

None

Project No. MR-9

1. Title of Project/Program

   Wholesale Market Development Project

2. Location

   Vientiane Municipality, Louangphrabang Province and Savannakhet Province

3. Objectives

   To provide facilities for exchange and trade of commodities, including perishables, at the wholesale level in major cities and thereby (i) provide traders and farmers better marketing opportunities; (ii) enable locate buyers and sellers, transport links; and the major markets; and (iii) facilitate market clearance and reduce losses in perishables trade through wholesale activities

4. Project/Program Description

   With NEM and the market economy since the mid eighties, trade in agricultural commodities has been increasingly determined by market forces. However, results of preliminary marketing study conducted by JICA during January - July, 2001 show poor development of the wholesale market in Lao PDR. The major findings on wholesale market of this study are summarized below:

   (1) For larger sale farmers (rice, live animals, and fish), middlemen purchase farm products from individual households during the harvesting period. The existence of such small scale trades with short marketing channels has resulted in the limited number of wholesalers. Therefore, there are difficulties to find true wholesalers in Lao PDR.

   (2) In the market wholesale activity takes place alongside retail activity. Wholesale operations start in the early morning and it is replaced by retailing shortly after. A large number of traders are constantly on the move and operate without any base or storage place.

   (3) The State Enterprise for Food and Crop Promotions (SEFCPs) play a main wholesale role in each province. They are involved in paddy/rice (major product), cattle/meat, import and export of food commodities. The other operators in the wholesale market systems are large size rice mill (rice), import-export company (rice, seafood), cattle purchase group/association, slaughterhouse/abattoirs, fish culture farm, fishermen cooperatives, vegetable/fruit/NTFP traders, coffee association and commercial farms.

   (4) The present wholesale market covers limited products such as paddy/rice, animal/meat and exportable products only. Agricultural products such as vegetables, fruits and fish have no wholesale market. Middlemen purchase most of those products directly from producers and then middlemen sell those to consumers in retail market.

(5) There are some regulatory barriers that are hampering the flow of agricultural commodities. The regulatory barriers are established to regulate the price of food commodities and to guaranty food security in their provinces. In the actual practice in stead of regulating price, SEFCP are fixing prices for commodities (paddy, rice and meat) which are sometime lower than production costs. In some province, SEFCP has the monopoly to market food commodities, and private enterprises.

(6) Generally, present conditions of wholesale market are characterized by i) poor market facility including base facility, office, electricity, water supply and sanitary facilities, and ii) poor access road and limited parking space.

Considering the above background, it is judged that proper wholesale market system should be developed for acceleration of market economy on agriculture. Moreover, the wholesale market will contribute to stabilize price, increase quality and reduce market cost of agricultural commodities.

The proposed project will improve wholesale market system in Vientiane municipality, Louangphrabang province and Savannakhet Province including whole market regulation, rehabilitation/construction of wholesale market facilities and improvement of management & operation of wholesale market. Prior to the practical implementation of the project, the feasibility study will be made for: i) clarification of present situation, constraints and development needs on wholesale market, ii) development plan on wholesale markets in terms of institution, capacity building, market channel, site selection and facility construction, iii) design and cost estimate on market facilities, iv) implementation plan including training program and O&M. The training program of wholesale market staff is important component of the project. The staff training will be made in the form of on-job training, and study tour in other countries.

5. Project Components

(1) Technical assistance for feasibility study on development of wholesale market in Vientiane municipality, Louangphrabang province and Savannakhet province as well as design and construction of wholesale market facility,

(2) Technical assistance for improvement of wholesale market regulation, operation and management for wholesale market system,

(3) Rehabilitation or construction of wholesale market facilities, and

(4) Implementation of training program for staff in wholesale market and government staff related to wholesale market.

6. Project Costs

Total Project Cost: US$ 6,661 thousand

Cost Item	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Capital Cost	429	1,860	1,788	1,716	216	6,009
Recurrent Cost	68	160	158	156	111	652
Total	497	2,020	1,946	1,872	327	6,661

7. Implementing Agency

   Ministry of Commerce

8. Organizational and Staffing Requirements

   Wholesale market committee will be organized newly in each wholesale market by concerned stakeholders including producers groups, shipping groups, wholesalers, government staff.

9. Implementation Schedule

   The project will be implemented in 5 years according to the following schedule.

   (1) 1st Year: Study period for wholesale market system including design and cost estimation of rehabilitation/construction 3 wholesale markets in Vientiane municipality, Louangphrabang province and Savannakhet province.

   (2) 2nd Year Rehabilitation/construction of wholesale market in Vientiane municipality and T/A for operation of this wholesale market, and implementation of staff training program.

   (3) 3rd - 4th year: Rehabilitation/construction of wholesale markets in Louangphrabang and Savannakhet provinces and T/A for operation of these wholesale markets, and implementation of staff training program.

   (4) 5th year: T/A for operation of three wholesale markets, implementation of staff training program, and implementation of M&E survey and review of the project.

11. Expected Benefit

   (1) To expand trade volume and varieties of agricultural commodities,

   (2) To make fare market price of agricultural commodities,

   (3) To reduce market costs for agricultural commodities, and

   (4) To keep food hygiene of agricultural commodities properly.

12. Assessment of Possible Problems and Bottlenecks in Implementation

   It is reported that there are some regulatory barriers in commodity related to the government regulation or intervention. For formulation of fair market price, regulatory control and intervention of government should be reduced as much as possible.

13. Assessment of Natural and Social Environment

   (1) Natural environment: No direct negative impacts are expected.

   (2) Social environment: No direct negative impacts are expected.

14. Special Arrangements

None

8. Rural Finance

Project No RF-1

1. Title of Project /Program

   In-service Training of SOCB Staff and the Expansion of the Training Center

2. Location

   Nationwide

3. Objectives

   Commercial banking is relatively new and approaches to banking and finance need to be reorganized. The SOCBs and the APB are beset with numerous operational problems. Bank staff in both SOCBs and APB need to be trained in the principles of banking and in commercial approaches to banking. The objective of the project is to provide continuous training to Bank staff both in the SOCBs and the APB so as to upgrade the level of competence of bank staff in commercial banking. In pursuit of this objective, training would extend outside in-service training to students who wish to pursue banking as a career. All training whether in-service training and longer term training for students would be at the BOL Training Center.

4. Project/Program Description

   The SOCBs and the APB have been in operation since 1993 but are in a weak financial position. They have limited expertise and staff. Commercial banking capacity, in particular credit and risk assessment skills is extremely limited. There are also severe weaknesses in accounting standards. Several multi lateral agencies have been assisting the SOCBs and APB to improve corporate governance; upgrading accounting standards; improving the supervision capacity of BOL PDR and making changes to the regulatory policy to increase competition. As part of the overall reform program, the Government is committed to improving the SOCBs capacity and improving skills of all Bank staff. As part of this program, the project is designed to support the expansion in the program of training for SOCB and APB staff as well as provide for courses for those interested in banking as a career.

   The BOL Banking Training Center has been in operation since 1993 and is well located a few kilometers out of Vientiane. The Center is well provided with facilities for training, including in-house accommodation facilities. It has lecture rooms, conference and dormitory facilities to accommodate 50 trainees at any one time. The Training Center currently has 6 staff headed by an Acting Director and has offered 7 courses in the past twelve months. The Center has had a minimum of 32 and a maximum of 40 for these courses. The Center received some funds for renovation of the buildings from ADB in 1997. The Center offers a Beginners Course of six months duration for newly recruited Bank staff and other two, three months courses for SOCB staff. It offered one course in Credit Appraisal techniques.

   The project is for an expansion of these courses and for in-service training. There are over 5000 staff in the SOCBs and about 700 staff in APB. In addition, the Center needs to

draw up training material and formulate courses in various banking subjects, especially strengthen its training in credit appraisal, loan screening and cash flow analysis. It also needs to train Bank staff in standard bank accounting practices and procedures and loan portfolio analysis. There were 220 trainees in 2000 and 135 trainees in the first five months of 2001. The courses at elementary, intermediate and advanced courses have covered accounting, banking, and credit analysis. The Center is planning to introduce a two-year Diploma banking course covering all aspects of Banking. The training program for the diploma course covers four semesters of 20 weeks each, with fields of specialization such as money and banking, accounting of banking systems, and financial intermediation as well as 64 weeks of practical work. It is intended that this program links up with the University and offers an entry point for the University degree in Economics. It is proposed that this course with follow on in economics would lead to an entry for careers in banking for graduates.

5. Project Components

The Project Components are for:

(1) strengthening the courses and course curricula and to tailor the needs of the courses for commercial banking personnel;

(2) provision of a new two-year Diploma Course for students from high school who wish to pursue banking as a career;

(3) provision of short in-service training courses on specific banking topics for personnel of the commercial banks and APB.

(4) provision of courses for Mobile Credit Officers of APB and SOCBs on loan appraisal ,credit analysis and accounting.

6. Project Costs

The project cost is estimated to be about US$ 3.7 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Capital cost	1,080	680	500	550	0	0	0	0	2,810
Recurrent cost	135	123	118	120	103	103	103	103	908
Total	1,215	803	618	670	103	103	103	103	3,718

7. Implementing Agency

The project would be implemented by the Banking Training Center under the direction of the Bank of Lao PDR.

8. Organizational and Staffing Requirements

In view of the expanded program of training envisaged, the Center would need to recruit additional staff. It is proposed to hire 5 temporary staff to meet the increased work. In addition, it is proposed to recruit 10 additional teaching staff to support the existing six.

9. Implementation Schedule

   The program is to initiate the two-year Diploma Course in 2003 and follow up annually with an intake of 20-30 trainees. In addition, it is planned to conduct 3 seminars, 4 workshops and four short training courses each year This training would spread over 165 days a year and would cover a total of 240 trainees.

10. Lessons learnt and how incorporated into Proposed project

    The problems faced by SOCBs and APB over the past decade are in many ways due to the lack of qualified and well trained staff familiar with banking principles and with training in commercial approaches to banking. Training is therefore one of the pillars to successful commercial banking. The efforts by donors to restructure the existing banking institutions and make them commercially viable in large part depend on the quality of the staff.

11. Expected Benefits

    The project through regular and expanded training would provide a much higher quality staff for both SOCBs and APB and thereby assist in inculcating commercial banking principles and a viable banking system. The diploma course would also provide a resource pool well-trained in commercial banking principles.

12. Assessment of Possible problems and Bottlenecks in Implementation

    Nothing specific to mention

13. Assessment of Natural and Social Environment

    (1) Natural: Not relevant

    (2) Social: Not directly relevant

14. Special Arrangements

    None

Project No. RF-2

1. Title of Project/Program

   SOCB Operational Performance Improvement and Extension to Rural Banking

2. Location

   Nationwide

3. Objectives

   The SOCBs are not commercially viable and are beset with several problems, the most important of which is the large ratio of non-performing loans (NPL). In October 2000, the ratio of non-performing loans was 40%. The current challenge is to improve the governance and the transparency of its management. In addition, measures need to be taken to make more rigorous loan screening standards, to establish standards of accounting, use external audits and promote disclosure. Several of these and other actions such as improving the legal framework, corporatisation, and improving the operational performance are currently being addressed with assistance from ADB, World Bank and several other donor agencies. These efforts along with improved Bank supervision by BOL should bring about desired results by 2005. On completion of these reforms, SOBC services should be expanded to cover rural areas and farmer needs.

4. Program/Project Description

   The activities of SOCBs are mainly in urban districts and in specific sectors such as commerce, services and construction. SOCBs are reluctant to open branches in rural areas as they are averse to risk and carry a large ratio of NPL. In addition, the rural people are not familiar with transactions through banks. The present status of SOCBs does not allow them to play an active role in the rural sector due to high transaction costs, lack of service orientation, and limited commercial banking skills. Also, the indirect control of interest rates limits the SOCBs ability to support rural financial system development. They also suffer from weak lending and supervisory practices. Government has recently approved a time bound action plan for recovery and disposal of bad debts and restructuring of balance sheets, and strengthening of governance of SOCBs.

   Although much has been done in the move towards operational improvements, there is still more to be done. Annual Audits of SOCBs have to be undertaken on international standards and practices. Capacity building through on-the-job training should continue although some work is going on assisted by ADB, GTZ, the State Bank of Vietnam and EU. The Loan loss provisions in financial statements need to be in place. Overall, there is a need to improve business development planning and market strategy so as to improve the commercial orientation. Credit policies and procedures and credit appraisal procedures need to be improved. Formal criteria for analyzing loan applications and a system of credit screening and investigations should be in place. There is also need for developing criteria for collateral evaluation and loan documentation appraisal. The project would also develop a system for administration of loans and design automated systems

for bad debt recovery.

The project would also establish effective treasury and fund management systems, including inter bank exposure limits, establish reserve and liquidity management processes and procedures, formulate funding strategies, improve deposit mobilization and strengthen branch management operations. Eventually, the project would pilot test an extension of lending products tailored to farmers and rural sector, carry out evaluations, monitor loan recovery and cash flow.

5. Project Components

(1) Restructuring and Reorganization of SOCBs. This component would be a continuation of the restructuring program that has been assisted by ADB, World Bank, EU and SIDA.

(2) Training of SOCB staff. Training would be a continuous process with in-service training and training at the BOL Banking Training Center.

(3) Development of loan products for the Farming and Rural sector. The development of loan products would be through a pilot program for developing and testing loan products suited to the specific needs of farmers, especially livestock and fisheries sub-sectors.

(4) Development of the Mobile Credit Officer System.

6. Project Costs

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Total
Capital cost	75	75	75	75	300
Recurrent cost	30	105	105	105	346
Total	105	180	180	180	646

7. Implementing Agency

Ministry of Finance through SOCBs

8. Organizational & Staffing Requirements

As indicated above

9. Implementation Schedule

The restructuring and reorganization of SOCBs would be undertaken by donors currently assisting in improving the operational performance of SOCBs. The cost of providing these services has not been estimated but is likely to be spread over the period 2002-2008. Training of SOCB staff has already been provided for in the Banking Training Center project. However, provision is expected to be made here for training of MCOs beginning 2007.

10. Lessons Learnt and how incorporated into Present Project

Lessons learnt form the problems associated with the running and operation of

unprofitable banking institutions that have been a drain on budget resources are to be taken account of in the reorganization of SOCBs. Lessons learnt from students' assessments of what they learnt from training courses at the BOL Banking training Center would be taken into account in formulation of the courses for MCOs.

11. Expected Benefit

    The expected benefit from a transformation of the SOCBs into commercially viable operations providing much needed deposit mobilization and lending facilities for future economic development projects in Laos.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    Possible problems relate to the possible slow pace of reform especially because of entrenched interests and slow decision making process

13. Assessment of Natural and Social Environment

    No evident direct relevance of natural or social impacts of the proposed project in the short or long terms.

14. Special Arrangements

    None

Project No. RF-8

1. Title of Project/Program

   Expansion of Credit to Farmer Groups by APB

2. Location

   Nationwide

3. Objectives

   Following the implementation of the Recommendations of the Diagnostic Study and the restructuring, corporatisation and if necessary, re-capitalization, it is assumed that APB would be a commercially viable operation. APB would then concentrate on expanding its services to farmer groups especially through loan products tailored to meet the needs of different farming systems and expansion of deposit mobilization. The objectives of this project are to develop new loan products specifically designed to meet farmer needs under different farming systems and commodities and set up a system for continuously review loan products and its relevance and marketability so as to make adjustments and keep abreast of customer needs and demands. The project design is for work in pilot villages in selected provinces in Lao and by careful monitoring, evaluation and testing develop a range of loan products to meet farmer needs so as to expand coverage of rural credit to farmer groups and micro-enterprises.

4. Project/Program Description

   APB is the only formal financial institution providing credit to the rural sector but it covers only about 10% of all rural families. Furthermore, most of APB loans are under group lending and the loan products are limited. Recovery rates are also low. APB currently provides long, medium and short-term loans but the outreach is very limited. It is reported that most APB loans are to SOEs and to farmer groups located closer to bigger towns and in proximity to APB branch offices.

   Under the project, pilot studies would be carried out to assess demand and loan recovery through a study of farmer budgets under different types of farming practices to assess the need for credit and the cash flow of the farm operations. This would be done for different farming systems and commodity specialization. Different types of loan products involving loan term, size and qualifying conditions as well as standard and flexible repayment conditions would be tested and monitored. The project on completion of pilot testing would develop several loan products to suit farmer and group needs for different regions. Loan products with a capacity for high recovery rates and in demand by farmers and farmer groups over a wide variety of farming situations would be developed The transaction costs of different loan products would also be analyzed. The pilot program would also expand the operations of the mobile credit officer (MCO) program and use the newly developed loan products through the MCO scheme. The transaction costs of these new loan products through MCO credit scheme would also be analyzed.

5. Project Components

(1) Carry out 12 detailed pilot surveys and feasibility studies in several districts in different regions under different farming types with a view to testing different loan products of different term, size and qualifying conditions as well as standard and flexible repayment provisions designed specifically to meet the needs of the farming community;

(2) Training of Mobile Credit Officers in loan appraisal techniques, cash flow analysis and farm budget analysis with particular reference to the new loan products;

(3) Setting up and expanding the MCO system in new provinces with adequate transport facilities for MCOs to visit farmers and farmer groups and offer a range of savings and loan products tailored to meet the needs of farmers;

(4) Consultant and advisory services for monitoring and evaluation of the credit expansion program and the MCO program and monitoring of loan servicing costs.

6. Project Costs

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Total
Capital cost	205	25	25	25	280
Recurrent cost	37	32	32	32	132
Total	242	57	57	57	412

7. Implementing Agency

APB under the guidance of the Ministry of Finance and MAF and Bank of Lao PDR

8. Organizational and Staffing Requirements

An additional 12 MCOs each year beginning 2009

9. Implementation Schedule

In view of the need to await the implementation of the recommendations of the diagnostic study, this project is expected to commence only after APB becomes a commercially viable bank.

10. Lessons Learnt and How Incorporated into Present Project

Lessons learnt from the operation of the MCO scheme in APB would be incorporated into the program

11. Expected Benefit

The extension of deposit mobilization and lending to the farming population is expected to lead to increase in production of crops, livestock and fisheries. Farmers and the rural population would receive higher incomes as a result of receiving additional resources to purchase farm inputs.

12. Assessment of Possible Problems and Bottlenecks

    No major problems are envisaged as the pilot programs and testing would provide adequate safeguards and knowledge for ensuring loan recovery. Close monitoring would also ensure a high level of repayment.

13. Assessment of Natural and Social Environment

    No adverse effects are expected on the natural environment as a result of the expansion of credit.

    As credit delivery expansion would be neutral in terms of income, it is not likely that the program would have any adverse social impacts.

14. Special Arrangements

    None envisaged.

Project No. RF-9

1. Title of Project/Program

   Agricultural Promotion Bank (APB) Restructuring and Reorganization on the Recommendations of Diagnostic Study

2. Location

   Nationwide

3. Objectives

   The objective of the project is to make the APB a commercially viable banking operation that would increase its penetration in the rural agricultural sector and also increase deposit mobilization and rely on the deposit base for much of its lending activity.

4. Project/Program Description

   Despite its rapid growth in the past nine years, APB is beset with several financial management, loan operations, loan recovery and business development problems. Resource mobilization is minimal, credit is supply driven and targeted to government-sponsored projects and loan recovery levels are low. Government subventions annually to APB are large. Only about 10% of all rural families receive loans from APB. APB currently gives loans with interest rates well below market rates and subsidized interest rates makes loans from other banks unattractive to agricultural borrowers and has a destructive long term effect on the financial and agricultural sectors. The low deposit base has increased APB dependence on BOL and donor credit lines for refinancing which together account for 92% of APB liabilities and capital.

   The Asian Development Bank has been assisting APB to improve its overall performance through technical assistance and program loans. It has now funded a very comprehensive diagnostic study of all aspects of APB operations. It would review the APB organizational structure, business practices, pricing policies, operating systems and accounting practices and procedures. The study would also analyze the loan portfolio, loan recovery rates, assess capital adequacy and deposit mobilization.

   The study would identify the major problems in all aspects of APB organization and operations as well as staffing. In consultation with APB, BOL, MAF and MOF the study will formulate a comprehensive reform package to address issues with a view to transforming APB into a viable rural finance institution with a specified time period. The diagnostic study is being funded by ADB and is to be undertaken by an overseas consultant company. The work is scheduled to commence in July 2001 and is expected to be completed in early 2002.

   On completion of the study and acceptance of the comprehensive reform package, a project would be formulated to restructure the APB along the lines of the package of recommendations of the Diagnostic study.

5. Project Components

The project components are to be agreed upon only after the comprehensive reform package has been drawn up by the consultant study team and the reform package has been accepted by Government. The components are expected to lay heavy emphasis on new approaches to operating procedures, management and deposit mobilization and lending policies.

6. Project Costs

Although it is very difficult to estimate the project cost at this stage, it is estimated at approximately US$ 5.8 million as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
Capital cost	1,660	1,660	600	600	600	5,120
Recurrent cost	153	153	121	121	121	669
Total	1,813	1,813	721	721	721	5,789

7. Implementing Agency

The project would be under the responsibility of the Ministry of Finance but MOF would work closely with Bank of Lao, MAF and APB.

8. Organizational and Staffing Requirements

To be agreed upon after the comprehensive reform package is presented and accepted by Government.

9. Implementation Schedule

To be decided after completion of study and acceptance of the recommendations by Government of Loa PDR

10. Lessons Learnt and How incorporated into present Project

11. Expected Benefits

APB would become commercially viable through new approaches to operating procedures, management and deposit mobilization and lending policies.

12. Assessment of Possible Problems and Bottlenecks in Implementation

One possible problem would be that Government would find it difficult to agree to place the APB on a commercial footing as it would have adverse implications for the SOEs currently being provided subsidized credit by APB. Another problem would be that by placing APB on a strictly commercial footing, farmers would no longer receive subsidized credit leading to increased cost of production and reduction in net incomes.

13. Assessment of Natural and Social environment

No direct impact evident.

14. Special Arrangements

Not known at this stage

Project No. RF-11

1. Title of Project/ Program

   Expansion of Micro finance Activities

2. Location

   Nationwide

3. Objectives

   Over 80% of the population live in rural areas and 80% of that population do not have access to formal financial services. Only 1% of the rural population has access to savings services. In addition, only 11% of rural households have borrowings and there is no effective mechanism to mobilize savings and deliver credit. ADB's outreach is poor and has little deposit mobilization and provides credit for only about 10% of the rural population. Its staff is not adequately trained for any of the activities and the institution is in need of major reform. It is unsustainable and manages through annual government assistance.

   In the absence of adequate formal institutional rural financial services, microfinance institutions (MFIs) can bridge the market gap by transformation of mobilized savings into domestic loans to finance rural and farming economic activity. Microfinance is the provision of a broad range of financial services such as deposits, loans, payment services, money transfers and insurance to the poor and low income households and micro enterprises. This sector is not developed and is a major priority of government. There are a few potentially sustainable microfinance institutions but pilot projects are now starting and are showing potential.

   The major objectives of the project are to provide institutions in the form of microfinance institutions to village communities where with empowerment and ownership they create the framework for providing financial services over which they have a degree of control while at the same time provide for long-term sustainability. The project aims to create the appropriate policy framework for MFIs and gradually introduce MFI 's in rural areas to provide financial services.

4. Project/ Program Description

   A Government has established a Microfinance Task Force to make policy, regulatory and administrative recommendations for the Lao financial sector. The UNDP/CDF has been implementing the first comprehensive Microfinance Project since 1999 in Xaignabouri and Oudomxai. The national component of the project takes into account the need for policy issues, the need for regulatory reform and microfinance training facilities. The provincial component aims at supporting the creation of microfinance institutions by strengthening potential intermediate implementation units and providing micro capital grants to village based institutions and micro enterprise tailored financial services.

   The project has now moved into its third year of activity. The Microfinance Task Force is

carrying on with its functions and is arranging for policy, regulatory and legal changes to provide the enabling environment for fostering the development of MFIs. The project is facilitating the creation of MFIs in two provinces, following the "group lending" approach combined with a strong focus on savings mobilization, financial and institutional sustainability, according to a set methodology. Special emphasis is being given to training potential MFIs and helping them to reach sustainability. A national Microfinance Training Center has been established and the Center has now set up extensive bilingual Lao-English training material. Training is underway on a cost recovery basis.

Accredited Agents were appointed and received training and prepared a three-year MFI proposal. There are now over 300 savings and credit groups in the two provinces with over 1,000 borrowers.

Plans are for MFI activities to be extended to the other provinces on a very gradual basis. This could be done as an extension of the current project or by using similar complementary approaches to introducing MFIs. The proposal is for one province to be added on each year to the MFI activities and the expansion to take place on the same model and method as developed under the UNDP/CDF project.

5. Project Components

National Component

The aim is to create an enabling environment for the development of microfinance. (1) A Microfinance Task Force is already in place to sensitize government and other stakeholders on the mechanisms needed to establish viable microfinance institutions. This calls for microfinance policy development and legislation and regulations. Work is underway on these fronts. (2) The microfinance Training Center is now in operation and provides training to Accredited Agents and Credit Officers and other interested parties. The objective is to provide training and a national facility to provide knowledge for improving microfinance practice in the provinces. (3) Project funds capitalization through grants to emerging microfinance institutions that offer scope for sustainability.

Provincial Component

Creation of microfinance institutions in the provinces following group lending and selection of accredited agents. There is a strong focus on savings mobilization, and on financial and institutional sustainability. Special emphasis is placed on training potential MFIs and helping these to reach sustainability.

6. Project Cost

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Total
Capital cost	640	640	640	640	640	640	640	640	5,120
Recurrent cost	215	215	215	215	215	215	215	215	1,719
Total	855	855	855	855	855	855	855	855	6,839

7. Implementing Agency

   Ministry of Finance

8. Organizational and Staffing Requirements

   In the initial years, the project should rely on expertise from outside Laos to set up the framework and for training of provincial MFI leaders. Provision is therefore made for a Central MFI advisor and for international consultants to assist in training and in imparting knowledge to local people. After this has been done in some provinces, it is envisaged that local personnel would take on the responsibility for advise and assisting AC's and CO's in setting up the MFI system. It is estimated that costs for overseas consultants would be eliminated by about 2007.

9. Implementation Schedule

   Implementation schedule is to introduce MFI institutions to one province in each year so that by 2010 there would be 11 provinces covered by MFIs.

10. Lessons Learnt and How Incorporated into Present Project

    Micro finance is a new concept for Loa PDR and the initial experiences under the UNDP project indicate that a slow and cautious approach was adopted in its introduction. The system also had specialist organizations to assist in setting up MFIs, organizing groups, training and education in MFIs and very close supervision in both Xaignabouri and Oudomxai. This cautious approach should be continued in the other provinces and the initial years of introduction should be slow to enable empowerment and building confidence among beneficiaries in managing the system.

11. Expected Benefit

    It has been demonstrated in several countries that the cost of servicing loans in rural areas and among farming communities is measurably higher. MFIs enable mobilization of savings and recycling these savings for productive purposes by enabling use of the savings for productive activities. In addition, the group saving and loan methodology also assists in empowerment and creating a sense of ownership so that the group could be jointly and severally responsible for repayment.

12. Assessment of Possible Problems and Bottlenecks

    Possible problems arise from poor management of MFIs and possible misappropriation of funds. However, these adverse effects would be avoided through a system of checks and balances by the group and also adequate financial controls and accountability. Another possible problem is that there could be defaults on the loans. This too could be minimized if adequate attention is paid to assessing the use of the loan and the expected return on investment as well as close monitoring and setting up a system for periodic loan recovery.

13. Assessment of Natural and Social Environment

    No adverse effects are expected in the natural environment in the short run. Over time,

better and improved management practices in agriculture and use of chemical fertilizer and purchased poultry feed mix may lead to some adverse impacts for soil and water. No adverse social impacts are envisaged as the scale of operation is so small.

14. Special Arrangements

None

9. Rural Development

Project No. RD-1

1. Title of Project/Program

   Village-led Agriculture Development Initiative in Remote Rural Area (VADIRRA)

2. Location

   Nationwide. However, the Project will be divided into the following six sub-projects covering 18 provinces and about 600 villages.

   (1) VADIRRA in Champasak, Attapu, Saravan and Xekong; 100 villages

   (2) VADIRRA in Khammouan and Savannakhet provinces; 100 villages

   (3) VADIRRA in Vientiane Municipality, Vientiane and Borikhamxai provinces; 100 villages

   (4) VADIRRA in Xaisomboun and Xiangkhouang provinces; 100 villages

   (5) VADIRRA in Xaignabouri, Louangphrabang and Houaphan provinces; 100 villages

   (6) VADIRRA in Oudomxai, Bokeo, Louangnamtha and Phongsaly provinces; 100 villages

3. Objectives

   (1) To promote market-oriented agriculture in remote rural areas through village initiatives,

   (2) To increase living standards and reduce poverty in remote villages through agricultural development initiatives.

4. Project/Program Description

   According to the results of Lao Expenditure and Consumption Survey 1997/98 (LECS), out of 10,000 rural villages in Lao PDR, only 9% of rural villages have permanent access to market and 53% have access to a main road in the rainy season (79% in dry season). As a result, most farmers in remote areas have no access to new technology, improved inputs, rural finance and basic social services. Consequently, agriculture in remote areas remains at subsistence level. On the other hand, in the remote areas, there is huge potential for the development of market-oriented agriculture because of land and water resource availability covering various climatic zones.

   The proposed project aims at development of market-oriented agriculture in the remote rural villages that would be selected based on area specific potential and farmers' intention for development. The Project will employ an integrated approach for the development including the following activities:

   (1) Rural infrastructure development

   The rural infrastructure to be provided by the Project consist of (i) rural road (or village access track), (ii) irrigation rehabilitation, (iii) marketing infrastructure, (iv) electrification, and (v) water supply facility. The actual facilities for each sub-project will be decided

after undertaking a participatory study at the initial stage of each sub-project.

Fortunately, for the component of rural road, the Lao Government is now carrying out the Integrated Rural Accessibility Planning (IRAP) with the assistance of several donors (UNDP, DGIS Netherlands, UNV, ILO, AGIR France, WB and SIDA). During 1995-2001 period, IRAP Phase 1 has produced local road improvement/development plans for the selected 8 provinces, i.e. Oudomxai, Savannakhet, Louangnamtha, Xiangkhouang, Xaignabouri, Xekong, Khammouan and Louangphrabang. IRAP Phase 2 is now under the implementation for the period of 2001-2003 covering two additional provinces, i.e. Borikhamxai and Champasak. The IRAP outputs include, among others, a prioritized list of villages and districts for the rural road improvement/development, district maps showing the distribution of households in relation to basic goods and service facilities and how they are linked, and district development action plans. All these outputs were produced based on an established process of initial consultation at the village level. Although, the design and construction of rural roads are not carried out by IRAP, the IRAP outputs can be utilized fully in the implementation of the proposed VADIRRA project.

Irrigation rehabilitation will be needed for the promotion of high value crop production, particularly in the dry season. The rehabilitation priority will be given to village level small-scale schemes (service area up to 100 ha). In case of pump irrigation schemes, converting diesel pumps to electricity based pump schemes will also be needed. Village electrification will be an important component for conversion to electric pumps, as well as for general use. The component of water supply facilities will be needed in order to improve the access to safe potable water. The project will provide for installation of hand pumps and/or construction of open wells. The marketing infrastructure, such as collection point of farm products, will be provided in order to supply high quality products to market to receive higher prices.

These rural infrastructure construction works are proposed to be implemented only after community based agreements are established and/or endorsed under which the communities would agree to be fully responsible for the operation and maintenance (O&M). In addition, it is proposed to confirm the economic and financial feasibility carefully for each type of rural infrastructure in the study. This feasibility analysis will be carried out at the initial stage of each sub-project.

(2) Agricultural extension services

A nationwide agricultural extension system has not been established in Lao PDR. As an exceptional case, it is operational only in the donor assisted projects. This is because of the shortage of ordinary budget required for the operation of agricultural extension services. In addition, it is reported that technical level of PAFS and DAFO staff is too low to perform the services effectively. It is therefore needed to allocate sufficient budgetary allocations and create capable extension staff for the operation of sound agricultural extension services in a sustainable manner. In reality, however, these measures are still difficult for the Government to undertake. Donor assistance for agriculture extension is

thus required continuously until it can be undertaken by the Government.

Taking the above issues into account, the proposed project will provide extension services involving PAFS/DAFO staff who will be assigned specifically for the project implementation. The extension services to be provided to farmers in the selected villages will be designed to:

a. demonstrate new crops and/or new technologies in demonstration plots to be established in farmers' fields,
b. operate a farmer field school to ensure participatory knowledge-building and evaluation of new technologies,
c. assist a responsible organization for management of a micro-credit scheme,

Provision of training to the selected PAFS/DAFO staff will also be carried out. The training will be provided mainly on an on-the-job basis covering the following activities that will be carried out for the development of market-oriented agriculture in the selected villages.

Study stage

a. To establish criteria for selection of potential villages and identification of target villages,
b. To conduct participatory surveys in selected villages, and
c. To formulate development plans for each group of villages.

Implementation stage

a. To design the various rural infrastructure,
b. To supervise local contractors for the construction of rural infrastructure,
c. To operate and manage demonstration plots and farmer field school,
d. To provide training to a responsible organization for the management of micro-credit scheme, and
e. To monitor the project activities and prepare monitoring and evaluation reports.

(3) Micro-finance

The proposed project will provide micro-capital grants for implementing village based small-scale projects identified by the farmers themselves, e.g. livestock raising, fish culture, tree crops and local industries. Although it will be studied carefully in the initial stage of the Project, a general idea of the proposed micro-finance is as follows.

a. Implementing agency will be a NGO and/or similar organization having a potential for micro-finance management,
b. Micro-capital grants will be allocated on a group basis,
c. The amount to be available for each district will be US$ 20,000,
d. Training for the staff of the implementing agency the group members will be provided by the project continuously during the project period,
e. The project will also assist the implementing agency for evaluation of farmers' proposed projects for lending.

5. Project Components

The project components will principally be as follows for all the sub-projects:

(1) Technical assistance for the development study and participatory survey in which a village initiative agricultural development plan will be formulated.

(2) Technical assistance for the project implementation,

(3) Rural infrastructure including rural road, irrigation rehabilitation, marketing infrastructure, rural electrification, and water supply facility,

(4) Agricultural extension services including training of PAFS/DAFO staff, establishment/operation of demonstration plots and farmer field school, etc.,

(5) Micro-capital grants for micro-finance for implementing village based small-scale projects,

(6) General and direct operating expenses, and

(7) Equipment including motorcycles and computers for extension services.

6. Project Costs

As explained in paragraph 9, three sub-projects would be implemented during the 10-year period. The cost for the implementation of three sub-projects would be as follows.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total
Capital cost	770	1,920	2,640	2,526	3,852	3,738	3,082	1,818	1,212	1,212	22,770
Recurrent cost	39	305	342	570	625	854	587	549	284	284	4,437
Total	809	2,225	2,982	3,096	4,477	4,592	3,669	2,367	1,496	1,496	27,207

7. Implementing Agency

PAFS and selected DAFO in each province. Close coordination linkage has to be established with MCTPC and NAFRI at National, Provincial and District levels.

8. Organizational and Staffing Requirements

This project will be implemented under the present organizational framework of each province. PAFS/DAFO staff required for the project implementation are shown in the table below. It is proposed to assign these staff on a full-time basis in addition to the PAFS/DAFO staff presently available.

Sub-project	Required No. of PAFS/DAFO staff
1. VADIRRA in Champasak, Attapu, Saravan and Xekong	20
2. VADIRRA in Khammouan and Savannakhet provinces	20
3. VADIRRA in Vientiane Municipality, Vientiane and Borikhamxai provinces	12
4. VADIRRA in Xaisomboun and Xiangkhouang provinces	13
5. VADIRRA in Xaignabouri, Louangphrabang and Houaphan provinces	30
6. VADIRRA in Oudomxai, Bokeo, Louangnamtha and Phongsaly provinces	25
Total	120

9. Implementation Schedule

Out of the six sub-projects, three sub-projects are proposed for implementation over the next 10 years. These three sub-projects would consist of (i) VADIRRA in Khammouan and Savannakhet provinces, (ii) VADIRRA in Champasak, Attapu, Saravan and Xekong provinces, and (iii) VADIRRA in Vientiane Municipality, Vientiane and Borikhamxai provinces.

The implementation schedule of each sub-project would be as follows.

	Component	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
1.	T/A for the study						
2.	T/A for the implementation						
3.	Rural infrastructure design/construction						
4.	Agricultural extension services						
5.	Micro-finance						
6.	Equipment						

(1) Year 1:

a. Identify potential villages for the development of market orientation agriculture based on selection criteria to be established in each province,
b. Conduct participatory surveys in selected villages (or group of villages) and clarification of local needs and development potentials,
c. Formulate development plans (rural infrastructure, extension, and micro-credit) for the selected villages,
d. Establish monitoring and evaluation plan, and
e. Train PAFSs/DAFOs staff for extension activity.

(2) Year 2 to 4:

a. Implement construction works for rural infrastructure,
b. Operate demonstration plots,
c. Farmers field school operation using the demonstration plots,
d. Micro-credit introduction and operation,
e. Monitor the sub-project, and
f. On-the-job training of PAFSs/DAFOs staff.

(3) Year 5 to 6:

a. Demonstration plots operation,
b. Farmers field school operation using the demonstration plots,
c. Micro-credit operation,
d. Monitor the sub-project,
e. On-the-job training of PAFSs/DAFOs staff.

(4) Year 6:

a. Prepare monitoring and evaluation report, in addition to the above.

10. Lessons Learnt and How Incorporated into Proposed Project

    Many donors point out that it is imperative to involve beneficiaries in the project planning and implementation for the project sustainability. This project therefore proposes to employ a participatory approach throughout the project implementation period.

11. Expected Benefit

    (1) Expanded market-oriented agriculture in remote rural areas,

    (2) Improved farmers' production technology in high value produce, and

    (3) Increased supply of market-oriented produce both to external and internal markets.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    Shortage of capable staff in PAFS and DAFO would possibly prevent the project implementation.

13. Assessment of Natural and Social Environment

    (1) Natural environment: Negative impacts are expected from increased dosage of chemical fertilizers and agro-chemicals for the production of market-oriented crops,

    (2) Social environment: Negative impacts will possibly be found on social friction between the target villages and non-target villages.

14. Special Arrangements

    (1) Close coordination with MCTPC is needed, since this project will give priority to the villages identified by the IRAP project in the selection of target villages for the development,

    (2) Each PAFO has to establish an effective linkage with NAFRI in order to obtain applicable technologies that will to be disseminated by the proposed extension services to the selected rural areas,

    (3) In the present study, a rural development project/program similar to VADIRRA is proposed for implementation and is called the Area-based Integrated Rural Development Program (ABIRDP). It is therefore needed to establish clear selection criteria for villages (or village clusters) for the respective project/program. Since both projects/programs are to be implemented at the provincial level, such criteria are proposed to be decided by the rural development committee and/or agricultural development committee in each province. Basically, VADIRRA's target villages should be in remote rural areas having agricultural development potential, while the focus for ABIRDP's target villages should be on poverty alleviation, with agricultural development potential being unimportant, although cost performance of the project must still be considered.

    (4) The project component of demonstration farms will not necessarily be included, if similar activities were simultaneously implemented by other proposed projects/programs in the selected villages. The projects/programs that could

potentially implement these demonstration fields include (i) Crop Diversification Program, (ii) Sub-urban Horticulture Promotion Program, (iii) Export Oriented Crop Promotion Program, and (iv) Fruits Crop Promotion in Northern Region, Fruits Crop Promotion in Southern Region.

(5) For the best design of the micro-finance scheme for the project, it is proposed to study similar ongoing projects. Examples include UNDP/CDF sponsored micro-finance currently operated in Xaignabouri and Oudomxai provinces, and village revolving funds (VRFs) scheme established in the Agricultural and Rural Development Project in Vientiane Province (1997-2002 for phase II).

Project No. RD-3

1. Title of Project/Program

   Integrated Agricultural and Rural Development Project in Boloven Plateau

2. Location

   Boloven Plateau area, belonging to Provinces of Champasak, Saravane and Xekong

3. Objectives

   (1) To upgrade substantially and sustainably the living standard and reduce poverty in rural areas through increased and stabilized agricultural production.

   (2) To promote market-oriented agriculture through provision of agricultural and rural infrastructure, strengthening of agricultural supporting services and improvement of marketing systems.

4. Project/Program Description

4.1 Historical Background

From March 1995 to September 1996, Japan International Cooperation Agency (JICA) conducted a master plan and feasibility study on the Integrated Agricultural and Rural Development in Boloven Plateau (herein after called "the 1996 Study"), and the 1996 Study identified 16 model development schemes that will be implemented for 15-year period. A feasibility study was also made on the first phase development project composed of five priority model schemes that were selected from 16 model schemes.

In 1997, the Government of Lao PDR (GOL) requested the Government of Japan (GOJ) to implement three schemes out of the five priority model schemes on a grant aid assistance basis. However, the implementation of the three priority schemes has been left unrealized. Meanwhile, the socio-economic situation surrounding the Boloven Plateau area has changed drastically since the period of JICA's 1996 Study, i.e. remarkable expansion of coffee cultivation for export and recent decline of coffee price, improvement of transportation including Pakse Bridge across the Mekong River, development of market oriented agriculture, etc.

The Master Plan Study on Integrated Agricultural Development in Lao PDR conducted by JICA in 2000/01 reviewed the 1996 Study and its project formulation in Boloven Plateau in the context of Rural Development Framework. This review study aimed to assess the relevance of the development concept and strategy set in the previous JICA's 1996 Study, and to formulate an appropriate development plan, taking the above background and change of the socio-economic conditions for the last five years into account. The review study included the collection of the existing data and information, supplementary topographic surveys for the proposed farm to market roads and research and demonstration farms, and geo-hydrological survey for rural water supply in the priority scheme areas. In addition, a participatory rapid rural appraisal was carried out to grasp the present socio-economic conditions and farmers' intention for development in the priority

scheme areas.

As a result, the basic concept established in the 1996 Study is confirmed to be still applicable, and all the 16 schemes identified are proposed for the implementation within the frame of rural development. However, the project should be implemented on a step-by-step basis, starting from the priority schemes for which the present implementation capacity is available.

4.2 Prioritization for Implementation of Priority Model Schemes

The three priority model schemes, for which GOL requested GOJ the financial assistance for the implementation in 1997, are: namely Upper Champi Scheme in Champasak Province, Upper Kapheu Scheme in Saravane Province, and Upper Tayun Scheme in Xekong Province. In the Master Plan Study in 2000/01, the basic development concept and development strategy proposed in the JICA's 1996 Study were reviewed, and the relevancy of project formulation was proved appropriate especially from the viewpoints of the development policy, socio-economic and agricultural constraints, rural requirements, implementation capacity, etc.

The review study in the said Master Plan re-assessed the prioritization for implementation of five priority model schemes, and then concluded to implement the five model schemes by two stages, i.e. 1st slice implementation for the priority model schemes and 2nd slice for the rest ones. Of five model schemes, two schemes are selected as the 1st slice implementation, and the rest three schemes for the 2nd slice, as shown below.

Proposed Stagewise Implementation of Five Model Schemes

Priority Schemes	Province	Requested by GOL in 1996	Proposed in present study
Upper Champi Scheme	Champasak	○	1st-slice
Upper Tapoung Scheme	Champasak	—	1st-slice
Upper Kapheu Scheme	Saravane	○	2nd-slice
Lower Xe Set Scheme	Saravane	—	2nd-slice
Upper Tayun Scheme	Xekong	○	2nd-slice

As shown in the above, two schemes of Upper Champi and Upper Tapoung in Champasak Province are selected as the priority model schemes for the 1st slice implementation. The prioritization for the implementation is based mainly on the following considerations:

(1) Implementation capacity of PAFs and relevant agencies in Champasak Province is higher than the rest two provinces of Saravan and Xekong.

(2) Effects derived from the two priority model schemes are expected to be high for the coffee mono-culture areas prevailing in the Boloven Plateau in both the needs of quality improvement of coffee products and crop diversification.

4.3 Description of Two Priority Model Schemes

(1) General Information

The general information including the socio-economic condition and the farmers' intention for the development in the concerned villages in the priority

model scheme areas in 1995 and at present (2001) are mentioned below and summarized in the next page.

(a) Population and Number of Household

The annual growth rate of population and number of household in Upper Champi area from 1995 is estimated at 8.8 % and 6.9 % respectively. Those in Upper Tapoung area is 4.3 % and 6.2 % respectively.

(b) Change in Agricultural Condition

The agricultural condition has changed in these five years. The coffee area expanded to 51% and 73% in Upper Champi and Upper Tapoung areas respectively. In Upper Champi area, the rate of coffee mono-culture farmers increased from 49 % to 95 %. This shows that Upper Champi has already formed as the coffee production area. While in Upper Tapoung area, the rate of coffee mono-culture farmer decreased from 30 % to nil, and all of farmers cultivate both coffee and vegetables. This change is caused by the fact that Upper Tapoung is marginal area for coffee cultivation in terms of altitude where frost damage sometimes take place, thereby lacking in stable coffee production. The sharp drop of coffee price also drove the decline of coffee mono-culture. Although the coffee area in Upper Tapoung is still expanding, but this may not be for produce of coffee but for to keep right of land title.

Socio-economic Conditions of Priority Model Schemes

Project area	Upper Champi Area		Upper Tapoung Area	
Altitude（m）	900-1,200		1,200-1,260	
Gross development area（ha）	870		100	
Year	1995	2001	1995	2001
Number of village	8	8	3	3
Number of HH	770	1,046	260	354
Population (person)	4,730	7,260	1,480	1,830
Illiterate ratio (%) (M, F)	25 (40, 60)	15 (28, 80)	8 (23, 77)	6 (39, 61)
Agricultural condition（HH）	Coffee only:49% Coffee/Tea:50% Total coffee area in 8 villages : 1,627 ha、Area of tea:254ha	Coffee only:95% Coffee/Tea:5% Total coffee area in 8 villages : 2,462 ha、Tea area:117ha	Coffee only:28% Coffee/Tea:62% Total coffee area in 3 villages: 430ha、Vegetable area: 134ha	Coffee only:0% Coffee/vegetables: 100% Total coffee area in 3 villages:746ha、Vegetable area:136ha Upland rice is continued
Condition of the land for development（ha）	Coffee:460ha Tea:130ha	Coffee:700ha＊ Tea:60ha＊	Most of area is fallow wild grass owned by villages	Most of area is fallow wild grass owned by villages. Some parts were allocated to villagers.
Constraints for development, problems	Water deficit for coffee、 Low quality of coffee,、 Frost damages for coffee, Short in agricultural techniques.	Low price of coffee, Low yield of coffee, Water deficit for coffee, Low quality of coffee	Water deficit for vegetables, Short in agricultural techniques	Low price of coffee, Low yield of coffee, Water deficit for vegetables, Low price of vegetables, Low yield of crops by short fallow period
Rural water supply	Gravity-pipe x 2, Shallow well x 1	Total 69 deep wells in KM36、38	No wells, all using river water	Total 44 deep wells in 2 sample villages

Notes: HH stands for household.

(c) Land in the Scheme Area

The land in Upper Champi area has been mostly planted with coffee, and the land proposed in the 1996 study for establishment of upland crop trial and research farm has been also distributed to individual farmer and planted with coffee. On the other hand the land proposed for development in the Upper Tapoung area has been distributed to villagers but it remains unchanged from the grassland.

(2) Agricultural and Rural Constraints and Farmers' Intention for Development

Through the participatory rapid rural appraisal conducted in the master plan study in 2000/01, the agricultural and rural constraints are identified, and the

needs and intention for development expressed by the farmers are as described below.

(a) Slash-and-burn shifting cultivation

The slash-and-burn shifting cultivation is still being practiced with the same scale as in 1994. The Government has declared to stop the slash-and-burn shifting cultivation by 2005 as the national strategy. Therefore, farmers, who have earned livelihood by slash-and-burn shifting cultivation, have to carry out rotational farming management in the already deforested areas where a short-term cycle rotational farming is only possible. Therefore, they are facing serious problems how to obtain sufficient foods and agriculture products for their living under these conditions.

The local Governments have also been providing various extension activities on the alleviation of slash-and-burn shifting cultivation to farmers in the Boloven Plateau showing new trials to sustain sufficient and stable agriculture product for the farmers. But, the extension of technology on alleviation of slash-and-burn shifting cultivation is still poor. Extension of the technical support services such as the establishment of technology on the settled farming system, is high demand and needs for the local Governments and rural people.

(b) Sharp drop of farm gate price of coffee and necessity of crop diversification

Farm gate price of coffee has decreased by 75% in arabica coffee and 85% in robusta coffee in Boloven Plateau area during the period of 1995 - 2001 due to sharp drop of international price. The decrease of the farm gate price has severely affected to the income of farmers. The farmers are trying to change in their farming management and they strongly request the Government to extend the technology on crop diversification. It is recommended to strengthen current movement of crop diversification, for which tropical crops and food crops has been introduced into coffee farmers as inter crops.

(c) Poor agriculture supporting services

Agricultural supporting services do not function satisfactorily due to shortage of qualified staff, shortage of operation fund, and lack of equipment. Farmers have not well known activities of agriculture support services undertaken by the local Governments. Agriculture supporting services should be strengthened from viewpoints of institutional development and human resources development.

(d) Low quality of crops

This is one of bottlenecks to sustain higher market price. Poor quality of crops has been caused by improper management of post harvest. In addition, farmers themselves, middlemen and sellers are not much interested in quality of crops.

It is necessary to improve technology of post harvest and increase awareness of farmers and middlemen regarding quality control.

(e) Over-supply and low market price of vegetables

Over-supply and low market prices of vegetables, especially cabbage, were take place in the dry season because many farmers cultivate the same vegetable mainly in their home gardens. It is necessary to introduce new techniques, especially adjustment of cropping pattern and more crop diversification to stabilize supply of vegetables all year-round.

(f) Poor social infrastructure and marketing activities

Villages of Upper Tapoung and Upper Champi schemes have a comparatively favorable location for local marketing in the Boloven Plateau and are connected with rural roads. But, some sections of the roads have been seriously damaged, and the village people have met severe problems of transportation and marketing, especially in the rainy season. This is one of reasons for lower qualtiy of agricultural products. The farmers requested urgent rehabilitation of the access roads to main market roads. They also need small market facilities to strengthen bargaining of their agriculture product.

(g) Poor conditions of the water supply facilities

Rural water supply is not in satisfactory conditions to sustain hygiene conditions of the village people, and village people have met a lot of disease problems in the dry season. Some village people have improved their water supply system through construction of shallow tube wells and pipeline system of surface water supply from rivers. But, the development progress of the rural water supply is not satisfactory for the village people, especially in public utilities such as schools and village community places. Village people's demand on rural water supply development is high to improve their living environments.

(h) No facilities for activities for village communication and administration

The regional economy has been gradually developed through rural road development for these years. Social activities of the village people have been aggressive through their village community activities, extension activities of agricultural technology and management, etc. However, there are no facilities to support their activities in villages. They desires to have village community halls where village activities such as administrative workings, provision of public health care, agricultural extension services, etc. are held.

(i) Poor conditions of education in the village

School buildings have been deteriorated in all the villages, and farmers strongly need rehabilitation of the school buildings for improvement of educational

environments in the villages.

5. Proposed Development Plan for Priority Model Schemes

5.1 Basic Development Concept

Referring to the socio-economic conditions and the desires expressed by the people in the area, the development plans in the selected priority schemes were reviewed and proposed as described hereunder. These development plans were identified as essential matters to secure food for people, to improve the living standard in the area through crop diversification and to increase in agricultural production, also to improve social activities such as community development, schooling of children, marketing of produce, and cultural activities.

(1) Basic Development Concept in Upper Tapoung Area

As described preceding chapters, GOL has been strongly promoting strategy to reduce shifting slush-and-burn cultivation. On the other hand the techniques of the settled farming system (techniques for sustainable agriculture) has not been developed and not extended to the farmers. Under the circumstances the farmers in the project area have started crop diversification activities to avoid defect of mono-culture of coffee that is susceptible to frost damage and price fluctuation. Basically the farmers are carrying on the diversified crop farming by applying shifting cultivation techniques under a few years short fallow period. Then the productivity is low and not well stabilized.

The marketing system in the area is primitive and the farmers have less bargaining power, and by the multi effect with the poor social environment the most of the people are in the poor condition.

Taking into account the needs of development, farmers' intention for development, and the condition of the available resources, the following integrated development is proposed to improve the living standard of people in the area.

Proposed Components for the Upper Tapoung Area

(a) Marketing System Improvement in Farm Area	
a-1 Establishment of marketing facility	Market facility, water supply, management organization, institutional organization for market information service
a-2 Improvement of farm to market road	Road from Pakxong to Houaisan village
(b) Settled Farming Systems Development	
b-1 Establishment of NAFRI Out-reach Research Farm	Research farm including buildings and facilities,
b-2 Demonstration farm for settled farming system	Farm plot for farmers including irrigation/drainage facilities, farm road, etc.
(c) Social infrastructure improvement	
c-1 Improvement of community hall	Multipurpose hall, office for village administration, water supply, etc.

(2) Basic Development Concept in Upper Champi Project Area

The Upper Champi area has already established as the main center of coffee production in the Boloven Plateau, while the farmers have recognized the necessity of crop diversification and low yield with low quality of coffee. The area is located along the National Road 23, and well-facilitated with farm roads and access to the markets. However, these farm roads are unpaved with very steep slopes, and thus in dangerous conditions for products transport. The living standard in the area is comparatively higher than that in the Upper Tapoung area. It is assumed that the farmers have capacity to improve their condition by the manner of the self-reliance. Taking these points into consideration, the proposed development component in the area is to improve the part of rural roads from farm to market, resulting in mitigation of dangers in farming activities and upgrading of product quality.

5.2 Development Strategies and Approaches towards Implementation

(1) Improvement of Marketing System in Farm Area

The proposed improvement is composed of the two main items; (i) establishment of market facility in Xe Tapoung village, and (ii) Improvement of Farm to Market Road. The construction work and operation and maintenance of the proposed road will be carried out by the existing organizations without establishment of new organization for that purpose. The proposed system aims to establish the marketing system in which the farmers will be able to participate in price formulation by establishing a market facility in the farm area. The market facility operation and management organization is necessary to be established under the village administration mechanism with assistance by district office of commerce. This organization will be formed during the stage of the construction work and will be able to undertake the operation and management work immediately after construction. The envisaged benefit of the improvement of transportation infrastructure and the market facility will be attained immediately after completion of the construction.

(2) Preparatory Activities prior to Settled Farming Systems Development

It is ideal to implement the proposed research farm and the demonstration farm based on further study to clarify the technical and managerial problems in the proposed plan. The problems to be clarified prior to the implementation are especially for; (i) the farm land development method, (ii) necessity and effect of irrigation under the specific climate condition in the area, and (iii) to promote and confirm the establishment of organization and budget allocation for the operation of the research and demonstration farms, as well as (iv) to promote farmers' participation to the implementation. The preparatory activities will be conducted for about three years. The contents and scale of the Settled Farming Systems Development will be set only after evaluating the outputs of preparatory activities.

(3) Social Infrastructure Improvement

With the decentralization policy declared in March 2000, the village organization is defined as an implementing unit of the development projects. This policy has resulted in increase of village administrative activities, however their organizational activities are limited due to lack of village community facilities. In fact in the Upper Tapoung, administrative works and village conference are held in the village chief's house. In connection with the provision of market facilities that will be operated and maintained by the related village organizations, the village community halls have to be facilitated along with the improvement of marketing system in farm area.

Villagers houses in the Upper Tapoung are individually or collectively facilitated with hand-pumped shallow tubewells. The water supply facilities are also required for the village community halls, since such various social activities requiring better quality of water as public health care services will be frequently held here. The village community halls associated with water supply facilities will be managed by the existing village organization without technical guidance.

(4) Needs of Technical Assistance to Settled Farming System Development

The settled farming system development conducted in the NAFRI out-reach research farm have a wide range of objectives, including research and trials of selection of adequate crop varieties, soil management, improved farming, etc., training and guidance for extension workers and farmers, seed and seedling multiplication, and other integrated farming techniques. These objectives conform to the national strategy of reduction of slash-and-burn shifting cultivation, and therefore NAFRI is placing a strong emphasis on these issues through locally established national agricultural research stations. The main constraint to undertaking research and extension works is lack of experience in the government staff who will be directly engaged in. For this reason, it is proposed to provide the NAFRI out-reach research farm and demonstration farm in the Upper Tapoung area with a technical assistance to mobilize the research and extension activities and train the government's staff to be deployed. The period of technical assistance is three years after the construction of facilities.

(5) Time-frame of Implementation

From the above discussions, the priority model schemes is divided into the following two sub-schemes:

(a) Priority Model Sub-scheme - 1, including Improvement of Marketing System and Social Infrastructure Improvement in farm areas, and Preparatory Activities for Settled Farming Systems Development.

(b) Priority Model Sub-scheme - 2, including Settled Farming Systems Development and Technical Assistance for Settled Farming Systems Development

The time-frame for the Priority Model Sub-scheme - 1 consists of the marketing system improvement and social infrastructure in farm areas for one year period, and preparatory activities for settled farming system development for three year period. The implementation timing of the Priority Model Sub-scheme - 2 will be examined after the evaluation of outputs from the preparatory activities for it. The time-frame for the Priority Model Sub-scheme - 2 is expected to be four year period including the technical assistance to the settled farming system development.

The time-frames for both the priority model sub-schemes are expressed below.

Implementation Time Frame of Priority Model Sub-scheme - 1

Development Plans	Year		
	1st	2nd	3rd
I-1 Marketing System Improvement in Farm Area			
(1) Improvement of farm to market road	○		
(2) Establishment of marketing facility	○		
I-2 Improvement of village community halls with water supply facilities	○		
II Preparatory activities for Settled Farming System Development	○	○	○

Implementation Time Frame of Priority Model Sub-scheme - 2

Development Plans	Year			
	1st	2nd	3rd	4th
I Construction of Facilities for Settled Farming System Development				
(1) NAFRI out-reach research farm	○			
(2) Construction of demonstration farm	○			
II Technical Assistance to for Settled Farming System Development		○	○	○

6. Project Components

The project proposed for the integrated agricultural and rural development in the Boloven Plateau is focussed on the Priority Model Sub-scheme - 1, covering marketing system improvement in farm area, preparatory activities for settled farming system development and improvement of village community halls associated with water supply system. The Priority Model Sub-scheme - 2 will be examined only after evaluating the outputs of preparatory activities for the settled farming system development. Therefore, the proposed components of the project are as follows:

(1) Rehabilitation of farm to market roads (13.6 km in total) in both the Schemes and construction of market facilities in the Upper Tapoung Scheme,

(2) Construction of rural infrastructure including village community halls and rural water supply systems in the three villages in Upper Tapoung Scheme,

(3) Technical assistance for the preparatory activities for settled farming system development

The needs on agriculture and rural development conform to the needs identified in the JICA's 1996 Study. Similar facilities on the research station and market facilities were proposed near both the scheme areas in the previous JICA development study under the same development concepts.

"Market facilities" is also substituted for the wholesale market of Pakxong town proposed in the JICA's 1996 Study. Because the Upper Tapoung Scheme is located at the center of the Boloven Plateau, and therefore expected to function as a market center in the farm area.

The features of facilities to be provided in the priority model sub-schemes - 1 are tabulated as follows:

Features of Proposed Facilities for Priority Model Sub-Scheme - 1

	Description	unit	Quantity	Remarks
I	Marketing System and other Rural Infrastructure			
I-1	Farm to Market Roads and Market Facilities			
	1) Rehabilitation of farm to market road	km	8.3	Pakxong town - Houay Xan village for Upper Tapoung Scheme
		km	5.3	Km 36 village in Upper Champi Scheme
	Subtotal	km	13.6	
	2) Market facilities	ha	1.0	in Xetapoung village
I-2	Rural Infrastructures			
	1) Rural water supply	km	2.2	Consisting of 2 new tube wells and one existing tube well, and water supply pipe to market facility, village multipurpose communication hall.
	2) Village community hall	m2	432.0	for 3 villages
II	Technical Assistance to Preparatory activities for Settled Farming System Development	lot	1	

7. Project Costs of Priority Model Sub-Scheme - 1

Project cost of the Priority Model Sub-Scheme - 1 is estimated as shown below.

Capital Cost Estimate of Priority Model Sub-Scheme - 1

Description	Project Cost (US $ millions)
I Marketing System and other Rural Infrastructure	
I-1 Farm to Market Road and Market Facilities	
a Farm to Market Road	3.62
b Market facilities	0.26
Subtotal (I-1)	3.88
I-2 Rural infrastructure	
a Rural water supply	0.21
b Village community hall	0.23
Subtotal (I-2)	0.44
I-3 Physical Contingencies (10 % of Subtotal (I-1 & 2))	0.43
Total (I)	4.76
II Preparatory Activities for Settled Farming System	
II-1 Technical Assistance	0.90
Total (II)	0.90

The period of Priority Model Sub-scheme - 1 is set at three years. The annual cost estimate including capital and recurrent costs are estimated below.

Annual Cost Estimate of Priority Model Sub-Scheme - 1 (US$ million)

Description	Yr 1	Yr 2	Yr 3	Total
Capital cost	5,060	300	300	5,660
Recurrent cost	152	9	9	170
Total	5,212	309	309	5,830

8. Implementing Agency

For Two Priority Schemes (Schemes of Upper Tapoung and Upper Champi)

(i) Provincial Agriculture and Forestry Services (PAFS) in Champasak Province
In collaboration with
(ii) Ban Itou Coffee Research Center (CRC), NAFRI
(iii) District Agriculture and Forestry Offices (DAFO) in Pakxong District
(iv) Other Provincial Agencies concerned

9. Organizational and Staff Requirements

The Project will be implemented under the present organizational framework of the central and local Governments.

Construction works and preparatory activities for the settled farming system development are directory managed by the PAFS of the Champasak Province in collaboration with DAFO of the Pakxong District, Ban Itou Coffee Research Center of NAFRI and other provincial agencies concerned.

Responsibility of O & M works of the each facility is handed over to the Pakxong DAFO or the provincial agencies concerned or the beneficiaries groups concerned depending to function of the each facility after accomplishment of the construction works.

Staff required for project implementation are as shown below.

Description	Proposed Staff No.
Champasak PAFS	12
Other Agencies	6
Pakxong DAFO	5
NAFRI	3
Total	26

10. Implementation Schedule

10.1 Implementation Arrangement for Donors' Assistance

The Priority Model Sub-scheme - 1 is to be implemented with financial and technical assistance of the donor countries and/or international agencies. Depending on the nature and scale of project components, the proposed assistance from the interested donors are divided into the following two types:

Component of Priority Model Schemes	Type of Assistance
1. Marketing System and Rural Infrastructure	Financial Assistance
2. Preparatory Activities for Settled Farming System Development	Technical Assistance

10.2 Implementation Schedule

Implementation period of the Priority Model Sub-scheme - 1 is three years. The following works are implemented.

(i) First year

(a) Rehabilitation of farm to market roads and construction of market facilities

(b) Construction of rural infrastructure (village community halls associated with water supply facilities)

(c) Preparatory activities for settled farming system development prior to the implementation of NAFRI Out-reach Research Farm and Demonstration Farm

(ii) Second and Third year

Preparatory activities for settled farming system development prior to the implementation of NAFRI Out-reach Research Farm and Demonstration Farm

The implementation schedule is shown below.

Description / Year			1st	2nd	3rd
I	Market System and other Rural Infrastructure				
	a	Farm to market roads and market facilities			
	b	Village community halls with water supply facilities			
II	Preparatory Activities for Settled Farming System Development				
		Technical Assistance for preparatory activities			

10. Lessons learnt and How Incorporated into Proposed Project

    Nil

11. Expected Benefit

    (1) Raised living standards of farmers through increased agricultural income as well as improvement of rural infrastructure such as access roads from farm to market, rural water supply and others.

    (2) Improvement of quality of agricultural products through improvement of market access roads and establishment of market facilities.

    (3) Enhancement of capability of government's staff and researchers through technical assistance for preparatory activities for settled farming system development.

12. Assessment of Possible Problems and Bottlenecks in Implementation

    Since Champasak Province is most competitive province in implementation capacity in the southern region of Lao PDR, many foreign assisted projects and programs are concentrated and being carried out. This results in shortage of competent local staff in PAFS and DAFOs. The success of the priority model schemes for Boloven Plateau integrated agricultural and rural development project is virtually depending upon the implementation capacity, especially availability of local government's staff. A careful pre-arrangement and prior commitment on deployment of local staff by Champasak Province is prerequisite for implementing this project.

13. Assessment of Natural and Social Environment

    (1) Natural environment: Agro-chemicals and chemical fertilizer should be applied properly according to the technical guidance.

    (2) Social environment: No impacts are expected.

14. Special Arrangements

    Nil.

Project No. RD-4

1. Title of Project/Program

   Area-based Integrated Rural Development Program

2. Location

   Nationwide. Selected remote and poor villages in each Province

   (1) Phase 1 (4 years); about 700 villages

   (2) Phase 2 (5 years); about 800 villages

3. Objectives

   To alleviate rural poverty and improve the livelihood of the rural population through improvement/development of rural infrastructure/facilities

4. Project/Program Description

   According to the results of Lao Expenditure and Consumption Survey 1997/98 (LECS), there is a wide disparity in socio-economic indicators between the rural and urban areas of Lao PDR. For example, households with access to clean water (piped or protected well) are 77% in urban and 45% in rural areas, villages with access to main road are 100% in urban and 44% in rural areas (in rainy season), villages with electricity are 91% in urban and 19% in rural areas, and villages with complete primary school are 60% in urban and 42% in rural areas.

   The proposed program is formulated based on the concept of the on-going rural development program which is now under implementation through the focal site approach. This approach was adopted in 1994 and defined as "to establish centers of changes and learning" for rural development. A total of 87 focal sites were established during the 1996-2000 period. Among these, however, only 59 focal sites (with about 950 villages) are operational as of February 2001 (this information has been obtained from LCRD).

   The proposed program will be implemented by improving several identified weaknesses of the on-going program as follows:

   1) Lack of clear criteria for the selection of villages or groups of villages for rural infrastructure improvement/development,
   2) Lack of clarity in roles and responsibilities of PRDCs and their relationship with other agencies,
   3) Incomplete monitoring and evaluation system for the rural development activities , and
   4) Low level of staff capacity in PRDCs and PRDOs to successfully undertake program.

   The major project components will be rural infrastructure that needs to be improved and/or developed based on area-specific conditions. These will include better roads, education, public health, communication, and irrigation facilities. Another important

component is that consultant services will be provided in order to ensure effective project implementation. A mobile consultant team will be stationed at RDO at the central level. The team will assist the PRDCs and PRDOs in setting up criteria and in selection of villages or groups of villages, allotment of roles, responsibility and accountability of relevant agencies, staff training, development of monitoring & evaluation system, and effective operation and maintenance processes. The consultant team will provide assistance by traveling to provinces in selection of the proposed programs so as to ensure the efficient implementation

5. Project Components

Construction works will be carried out for improvement/development of rural infrastructure. In addition, the following components will be provided for the smooth implementation of the program and effective/efficient O&M of the project facilities that will be carried out involving beneficiaries.

(1) Consultant services for training of local staff and assistance in development planning, design, construction supervision, monitoring & evaluation.

(2) Training of staff in PRDCs/PRDOs and in relevant district offices in rural participatory surveys, project planning, and implementation and project monitoring & evaluation, etc. ,

(3) Equipment (motorcycles) to enable field work to be carried out by the staff in PRDCs/PRDOs and relevant district offices,

(4) In-country travel costs in Lao PDR for the consultants, and

(5) Financial support for field allowances of PRDOs' staff for conducting the participatory surveys, construction supervision, regular field visits for the monitoring & evaluation activities and villagers training on O&M of the project facilities.

6. Project Costs

For the period of Phase 1 and 2, about US$ 250 million will be required as shown in the table below.

(Unit: US$ 1000)

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Capital cost	26,700	26,700	26,400	26,400	26,400	26,400	26,400	26,400	26,400	238,200
Recurrent cost	1,316	1,316	1,307	1,307	1,307	1,307	1,307	1,307	1,307	11,781
Total	28,016	28,016	27,707	27,707	27,707	27,707	27,707	27,707	27,707	249,981

The project costs are estimated based on data available in the National Rural Development Program, which planned the focal site development for a total of 1,026 villages with a budget of about US$ 159 million.

7. Implementing Agency

PRDC/PRDO in each province with assistance from RDO at central level

8. Organizational and Staffing Requirements

This program will be implemented under the present organizational framework. No additional staff will be required in each PRDC/PRDO. The presently available staff numbers are as follows:

Province	Member of Rural Dev. Committee	Rural Development Office Staff
1. Vientiane Mun.	5	6
2. Vientiane	5	6
3. Xaisomboun S.R.	7	6
4. Borikhamxai	5	5
5. Xiangkhouang	13	4
6. Savannakhet	7	13
7. Khammouan	3	1
8. Phongsaly	5	3
9. Louangnamtha	5	3
10. Oudomxai	5	5
11. Bokeo	5	3
12. Louangphrabang	5	3
13. Houaphan	4	3
14. Xaignabouri	5	3
15. Saravan	3	3
16. Attapu	5	4
17. Xekong	3	4
18. Champasak	4	2
Total	94	77

Source: National Rural Development Program, 1996 to 2000, Lao PDR

9. Implementation Schedule

As stated in paragraph 2, the program will cover about 700 villages in Phase 1 (4 years) and another 800 villages in Phase 2 (5 years).

The program would be implemented giving priority to socially depressed and highly populated districts/villages identified from the population census of 1995. Although it needs to be review before implementation, the priority order of each district is as shown in Table RD-4.1.

Because this program will be implemented across all provinces, priority districts/villages would have to be selected even in the provinces with better social development status as a whole (e.g. Vientiane Municipality). Even in such provinces, the priority order of districts given in Table RD-4.1 will be useful for the selection of districts/villages.

10. Lessons Learnt and How Incorporated into Proposed Project

See the above paragraph 4.

11. Expected Benefit

(1) Improved rural infrastructure that alleviate poverty and improve the livelihood of villagers,

(2) Beneficiaries in Phase 1 will be about 300,000 of the rural population, and 345,000 in Phase 2.

12. Assessment of Possible Problems and Bottlenecks in Implementation

(1) Political pressure in selection of target villages may bring bias in the development,

(2) Shortage of capable staff in PRDOs may prevent the project progress.

13. Assessment of Natural and Social Environment

(1) Natural environment: Although it will be very small, negative impacts are expected when land and water are developed, e.g. changes in land use and flow of surface water,

(2) Social environment: Positive impacts are expected from improved rural infrastructure, and negative impacts will possibly be found on social friction between the target villages and non-target villages. Another impacts are also expected among rural communities in (traditional) use of land and water.

14. Special Arrangements

None

Table RD-4.1 Priority Districts for Poverty Alleviation Type Rural Development Program (1/2)

	Province	District	Population Density Score		Social Dev. Status Score			Combined Score for Dev. Priority	
			Population Density (prn/km2)	Population Density Score	Principal Component Score a/	Social Dev. Status Rank	Social Dev. Status Score	Combined Score	Development Priority
			(1)	(2)	(3)	(4)	(5)	(6=2x5)	(7)
1	P.ATTAPU	Phouvong	2.9	1	3.594	5	11	11	2
2	P.ATTAPU	Samakkhixai	71.2	3	-0.836	2	3	9	2
3	P.ATTAPU	Sanamxai	10.8	1	1.343	4	8	8	1
4	P.ATTAPU	Sanxai	3.4	1	2.487	5	11	11	2
5	P.ATTAPU	Xaisettha	24.2	2	-0.061	3	5	10	2
6	P.BOKEO	Houayxay	27.0	2	-0.182	3	5	10	2
7	P.BOKEO	Meung	5.1	1	3.805	5	11	11	2
8	P.BOKEO	Paktha	20.6	2	2.180	5	11	22	3
9	P.BOKEO	Pha-Oudom	16.7	1	2.778	5	11	11	2
10	P.BOKEO	Tonpheung	27.6	2	0.192	3	5	10	2
11	P.BORIKHAMXAI	Borikhan	8.3	1	-1.031	2	3	3	1
12	P.BORIKHAMXAI	Khamkeut	11.0	1	0.631	4	8	8	1
13	P.BORIKHAMXAI	Pakkading	12.2	1	-0.436	3	5	5	1
14	P.BORIKHAMXAI	Pakxan	53.9	3	-2.565	1	1	3	1
15	P.BORIKHAMXAI	Thaphabat	16.5	1	-2.584	1	1	1	1
16	P.BORIKHAMXAI	Viangthong	3.7	1	1.738	4	8	8	1
17	P.CHAMPASAK	Bachiangchareunsouk	37.9	2	0.335	3	5	10	2
18	P.CHAMPASAK	Champasak	56.8	3	-1.157	2	3	9	2
19	P.CHAMPASAK	Khong	43.6	3	-0.854	2	3	9	2
20	P.CHAMPASAK	Mounlapamok	14.5	1	-0.183	3	5	5	1
21	P.CHAMPASAK	Pakxe	603.9	7	-3.615	1	1	7	1
22	P.CHAMPASAK	Pakxong	11.0	1	0.296	3	5	5	1
23	P.CHAMPASAK	Pathoumphon	16.5	1	-0.053	3	5	5	1
24	P.CHAMPASAK	Phonthong	81.6	4	-1.872	2	3	12	2
25	P.CHAMPASAK	Soukhouma	30.9	2	-0.374	3	5	10	2
26	P.CHAMPASAK	Xanasomboun	54.3	3	-1.007	2	3	9	2
27	P.HOUAPHAN	Et	26.2	2	-0.432	3	5	10	2
28	P.HOUAPHAN	Houamuang	10.9	1	0.830	4	8	8	1
29	P.HOUAPHAN	Sopbao	26.2	2	-0.166	3	5	10	2
30	P.HOUAPHAN	Viangthong	5.4	1	0.321	3	5	5	1
31	P.HOUAPHAN	Viangxai	20.8	2	-1.807	2	3	6	1
32	P.HOUAPHAN	Xam-Nua	19.2	2	-1.143	2	3	6	1
33	P.HOUAPHAN	Xam-Tai	12.6	1	0.404	4	8	8	1
34	P.HOUAPHAN	Xiangkho	26.2	2	-0.277	3	5	10	2
35	P.KHAMMOUAN	Boualapha	6.0	1	2.114	5	11	11	2
36	P.KHAMMOUAN	Gnommalat	15.0	1	0.815	4	8	8	1
37	P.KHAMMOUAN	Hinboun	16.9	1	-0.279	3	5	5	1
38	P.KHAMMOUAN	Mahaxai	9.9	1	1.191	4	8	8	1
39	P.KHAMMOUAN	Nakay	3.7	1	1.950	5	11	11	2
40	P.KHAMMOUAN	Nongbok	121.9	4	-1.793	2	3	12	2
41	P.KHAMMOUAN	Thakhek	74.5	3	-2.548	1	1	3	1
42	P.KHAMMOUAN	Xaibouathong	16.9	1	2.999	5	11	11	2
43	P.KHAMMOUAN	Xebangfai	20.6	2	-0.237	3	5	10	2
44	P.LOUANGNAMTHA	Long	8.8	1	3.432	5	11	11	2
45	P.LOUANGNAMTHA	Louang-Namtha	16.7	1	-0.465	3	5	5	1
46	P.LOUANGNAMTHA	Nale	15.0	1	2.388	5	11	11	2
47	P.LOUANGNAMTHA	Sing	15.4	1	2.695	5	11	11	2
48	P.LOUANGNAMTHA	Viangphoukha	7.7	1	2.427	5	11	11	2
49	P.LOUANGPHRABANG	Chomphet	20.0	2	0.664	4	8	16	3
50	P.LOUANGPHRABANG	Louangphrabang	78.0	3	-2.120	2	3	9	2
51	P.LOUANGPHRABANG	Nambak	30.9	2	0.589	4	8	16	3
52	P.LOUANGPHRABANG	Nan	27.7	2	0.732	4	8	16	3
53	P.LOUANGPHRABANG	Ngoy	15.9	1	1.175	4	8	8	1
54	P.LOUANGPHRABANG	Pak-Ou	29.5	2	1.129	4	8	16	3
55	P.LOUANGPHRABANG	Pakxeng	19.7	2	1.557	4	8	16	3
56	P.LOUANGPHRABANG	Phonxai	12.3	1	2.086	5	11	11	2
57	P.LOUANGPHRABANG	Phoukhoun	16.5	1	1.880	5	11	11	2
58	P.LOUANGPHRABANG	Viangkham	11.0	1	1.595	4	8	8	1
59	P.LOUANGPHRABANG	Xiang-Ngeun	28.3	2	0.847	4	8	16	3
60	P.OUDOMXAI	Beng	12.1	1	1.222	4	8	8	1
61	P.OUDOMXAI	Houn	17.3	1	2.015	5	11	11	2
62	P.OUDOMXAI	La	7.6	1	1.512	4	8	8	1
63	P.OUDOMXAI	Namo	12.3	1	2.288	5	11	11	2
64	P.OUDOMXAI	Nga	10.3	1	2.195	5	11	11	2
65	P.OUDOMXAI	Pakbeng	18.8	2	2.559	5	11	22	3
66	P.OUDOMXAI	Xai	17.1	1	0.290	3	5	5	1
67	P.PHONGSALI	Boun-Nua	10.4	1	-0.138	3	5	5	1
68	P.PHONGSALI	Boun-Tai	9.3	1	0.837	4	8	8	1
69	P.PHONGSALI	Gnot-Ou	7.3	1	0.932	4	8	8	1
70	P.PHONGSALI	Khoa	18.2	2	0.394	3	5	10	2
71	P.PHONGSALI	Mai	7.4	1	0.585	4	8	8	1
72	P.PHONGSALI	Phongsali	8.8	1	0.269	3	5	5	1
73	P.PHONGSALI	Samphan	9.4	1	0.977	4	8	8	1

Table RD-4.1 Priority Districts for Poverty Alleviation Type Rural Development Program (2/2)

	Province	District	Population Density Score		Social Dev. Status Score			Combined Score for Dev. Priority	
			Population Density (prn/km2)	Population Density Score	Principal Component Score a/	Social Dev. Status Rank	Social Dev. Status Score	Combined Score	Development Priority
			(1)	(2)	(3)	(4)	(5)	(6=2x5)	(7)
74	P.SARAVAN	Khongxedon	57.0	3	-0.541	3	5	15	2
75	P.SARAVAN	Lakhonpheng	22.7	2	-0.803	2	3	6	1
76	P.SARAVAN	Laongam	48.4	3	1.658	4	8	24	3
77	P.SARAVAN	Samouay	15.3	1	4.234	5	11	11	2
78	P.SARAVAN	Saravan	27.1	2	-0.020	3	5	10	2
79	P.SARAVAN	Ta-Oy	6.7	1	3.423	5	11	11	2
80	P.SARAVAN	Toumlan	21.8	2	2.100	5	11	22	3
81	P.SARAVAN	Vapi	26.1	2	-0.266	3	5	10	2
82	P.SAVANNAKHET	Atsaphangthong	14.0	1	0.185	3	5	5	1
83	P.SAVANNAKHET	Atsaphon	14.0	1	0.988	4	8	8	1
84	P.SAVANNAKHET	Champhon	77.7	3	-0.581	3	5	15	2
85	P.SAVANNAKHET	Khanthabouri	103.2	4	-2.990	1	1	4	1
86	P.SAVANNAKHET	Nong	8.9	1	3.347	5	11	11	2
87	P.SAVANNAKHET	Outhoumphon	57.0	3	-0.737	3	5	15	2
88	P.SAVANNAKHET	Phalanxai	14.0	1	0.306	3	5	5	1
89	P.SAVANNAKHET	Phin	21.2	2	1.510	4	8	16	3
90	P.SAVANNAKHET	Songkhon	46.7	3	-1.695	2	3	9	2
91	P.SAVANNAKHET	Thapangthong	10.2	1	0.895	4	8	8	1
92	P.SAVANNAKHET	Vilabouri	12.0	1	2.508	5	11	11	2
93	P.SAVANNAKHET	Xaibouri	42.6	3	-0.550	3	5	15	2
94	P.SAVANNAKHET	Xaiphouthong	103.2	4	-3.101	1	1	4	1
95	P.SAVANNAKHET	Xepon	14.8	1	2.477	5	11	11	2
96	P.SAVANNAKHET	Xonbouri	24.9	2	0.382	3	5	10	2
97	P.VIENTIANE	Fuang	15.5	1	-0.469	3	5	5	1
98	P.VIENTIANE	Hinheup	15.5	1	-0.490	3	5	5	1
99	P.VIENTIANE	Kasi	6.4	1	0.034	3	5	5	1
100	P.VIENTIANE	Keo-Oudom	23.9	2	-3.620	1	1	2	1
101	P.VIENTIANE	Met	6.4	1	-0.045	3	5	5	1
102	P.VIENTIANE	Phonhong	55.2	3	-3.094	1	1	3	1
103	P.VIENTIANE	Thourakhom	86.9	4	-3.240	1	1	4	1
104	P.VIENTIANE	Vangvieng	14.9	1	-0.778	2	3	3	1
105	P.VIENTIANE	Viangkham	86.9	4	-3.283	1	1	4	1
106	P.VIENTIANE	xanakham	9.8	1	-1.574	2	3	3	1
107	P.XAIGNABOURI	Boten	8.0	1	-2.155	2	3	3	1
108	P.XAIGNABOURI	Hongsa	13.2	1	-1.178	2	3	3	1
109	P.XAIGNABOURI	Kenthao	24.9	2	-1.686	2	3	6	1
110	P.XAIGNABOURI	Khop	13.2	1	0.007	3	5	5	1
111	P.XAIGNABOURI	Ngeun	12.2	1	-0.325	3	5	5	1
112	P.XAIGNABOURI	Paklai	18.7	2	-1.476	2	3	6	1
113	P.XAIGNABOURI	Phiang	13.3	1	-1.554	2	3	3	1
114	P.XAIGNABOURI	Thongmixai	18.7	2	-1.838	2	3	6	1
115	P.XAIGNABOURI	Xaignabouri	18.4	2	-1.177	2	3	6	1
116	P.XAIGNABOURI	Xianghon	13.2	1	-0.900	2	3	3	1
117	P.XEKONG	Dakchung	7.2	1	2.770	5	11	11	2
118	P.XEKONG	Karum	2.7	1	3.434	5	11	11	2
119	P.XEKONG	Lamam	10.3	1	0.162	3	5	5	1
120	P.XEKONG	Thateng	39.9	2	1.983	5	11	22	3
121	P.XIANGKHOUANG	Kham	16.9	1	-0.445	3	5	5	1
122	P.XIANGKHOUANG	Khoun	12.4	1	-0.054	3	5	5	1
123	P.XIANGKHOUANG	Mok-Mai	2.2	1	2.079	5	11	11	2
124	P.XIANGKHOUANG	Nonghet	14.0	1	1.430	4	8	8	1
125	P.XIANGKHOUANG	Pek	26.7	2	-2.281	2	3	6	1
126	P.XIANGKHOUANG	Phaxai	14.0	1	-1.438	2	3	3	1
127	P.XIANGKHOUANG	Phoukout	6.4	1	-1.335	2	3	3	1
128	S.R.XAISOMBOUN	Hom	2.7	1	0.207	3	5	5	1
129	S.R.XAISOMBOUN	Longxan	2.7	1	1.618	4	8	8	1
130	S.R.XAISOMBOUN	Phoun	6.8	1	0.731	4	8	8	1
131	S.R.XAISOMBOUN	Thathom	5.6	1	0.829	4	8	8	1
132	S.R.XAISOMBOUN	Xaisomboun	6.6	1	1.029	4	8	8	1
133	VIENTIANE MUN.	Chanthabouri	2029.5	7	-5.006	1	1	7	1
134	VIENTIANE MUN.	Hatxayfong	251.8	5	-4.548	1	1	5	1
135	VIENTIANE MUN.	Naxaythong	39.0	2	-3.446	1	1	2	1
136	VIENTIANE MUN.	Pak-Ngum	52.5	3	-2.990	1	1	3	1
137	VIENTIANE MUN.	Sangthong	26.9	2	-1.517	2	3	6	1
138	VIENTIANE MUN.	Sikhottabong	530.4	6	-4.782	1	1	6	1
139	VIENTIANE MUN.	Sisattanak	1876.7	7	-5.078	1	1	7	1
140	VIENTIANE MUN.	Xaisettha	511.9	6	-4.760	1	1	6	1
141	VIENTIANE MUN.	Xaithani	106.8	4	-3.536	1	1	4	1

a/: Principal Component Score is calculated based on the following five indicators:
a) Proportion of agriculture holdings in total holdings
b) Proportion of non-educated population (age 5+)
c) Literacy rate
d) Disease infected population
e) Proportion of non-electrified households
f) Proportion of non-lavatory households

(2) Population Density Score
Less than 18= Score 1
18-41=Score 2
41-80=Score 3
80-158=Score 4
158-295= Score 5
295-571= Score 6
More than 571= Score 7

(5) Social Development Status S
Rank 1 = Score 1
Rank 2 = Score 3
Rank 3 = Score 5
Rank 4 = Score 8
Rank 5 = Score 11

(7) Development Priority
Combined score is less than 8 = 1
Combined score is 8 to 16 = 2
Combined score is more than 16 = 3