

## CHAPTER 5 BASIC CONCEPT AND APPROACH FOR ACTION PLAN

### 5.1 Development Objectives and Strategy for Action Plan

The overarching national development objective across all the development sectors is to graduate from the group of least developed countries (LLDC) by the year 2020. This implies attainment of GDP per capita of US\$885 in 2000 constant prices by the year 2020, as defined by DAC. This objective has to be achieved in a sustainable and equitable manner, and also under the current transition from a command economy to a market economy.

The Lao economy is largely supported by the agriculture sector, as the major contributor to GDP accounting for about 53%. The agriculture sector continues to play an important role in economic development, although its share would gradually be reduced to around 30% in 20 years time due to relatively faster growth in the industry and service sectors. Thus, the performance of agriculture sector is key to successfully achieving the national development objectives. The Government has three distinct development objectives until the year 2020: (i) ensure food security and self-sufficiency in food; (ii) promote commodity agro-products for export; and (iii) stabilize shifting cultivation. These objectives are elaborated in the MAF's Vision 2020 drafted in 1997, and officially endorsed in the "The Government's Strategic Vision for the Agricultural Sector" (Strategic Vision) in 1999. The Strategic Vision presents two distinct development initiatives; one for flatlands along the Mekong corridor and the other for sloping lands. The agriculture sector would have to be developed on a policy platform of a market economy, with the flatlands development driven by market forces. The sloping lands development in the short to medium term would be by interventions designed primarily to tackle poverty and subsistence agriculture. In the longer term, the market economy would permeate the uplands as well through commercialization of agriculture.

Through dialogue with personnel from domestic and international agencies and through scrutiny of extensively collected information and references, the Study Team concluded that there is no difference between the development directions stated in the Strategic Vision and the national socio-economic development plan and international donors' assistance policies, although there were differing views on the pace of development and the degree to which the Government intervenes in the market place. In the wave of regional and worldwide globalization to which Lao PDR is being exposed as part of the transition to a market economy, the Strategic Vision gives a proper and clear development framework for the agricultural sector.

In the light of the above development framework and strategy, the Study attempts to establish an Action Plan for agricultural development towards 2020 and to formulate specific development programs and projects to be considered for implementation by GOL over the next 20 years. The Action Plan is based on the clarification of some important issues within the context of market economy. These are: (i) the public sector role in the Action Plan is limited to facilitation and regulation of private sector activities; (ii) the programs and projects are selectively implemented to assist in the transition to a market economy; and (iii) activities in the Action Plan are focussed on providing significant initiatives to increase in GDP.

## **5.2 Market Economy**

### **(1) Role of the Government**

The conceptual framework underlying the Action Plan is in line with the overarching government policy pursued since 1988 of moving to a market economy. Following NEM in 1986, the economy has been moving away from public sector investment and production activities; and a regulated and controlled economy, to a greater participation by the private sector in productive activities. Several public sector enterprises have been privatized and government controls on investment and prices have been gradually removed. Private investment, including private foreign investment has increased markedly. In a move to the market economy, market signals become significantly more important in guiding investment, production and consumption decisions. The marketplace for investment and production is guided by price signals and the profit motive. The key element in a market economy, is that government provides an enabling environment for the private sector and progressively removes regulations and control so as to permit the free play of market forces in production and consumption of goods and services. Under a market economy, the public sector does not involve itself in the production of goods and services. The government plays a facilitating role in agriculture development while producers (farmers), the agribusiness sector and consumers make the investment, production and consumption decisions. However, the government is expected to regulate the market in situations where it is in the interest of the public e.g. meat inspection or regulation of the manufacture and sale of food products or monopolistic trading practices.

### **(2) Market Failures and Externalities**

The Action Plan has, therefore, been drawn up in consultation with staff of MAF following these underlying principles. In a few situations, there are exceptions to the above such as when individual farmers are reluctant or slow to adopt new

technologies. In such situations there is a case under the “infant industry argument” for government to intervene through introductory “learning by doing” or demonstration programs. Government intervention is justified if it could be demonstrated that farmers are not adopting new technologies but government withdraws no sooner the technology has gained wide acceptance. The Action Plan includes several programs to foster such technology acceptance such as introduction of improved seed and fish fingerlings. Secondly, government intervention through programs is justified where there is clear evidence of “market failure” when private competitive markets tend to undersupply or do not provide for adequately. A case in point is remote and isolated villages where traders may not sell fertilizers and other inputs in sufficient quantity and in a timely manner due to the lack of profit incentive. This is often due to the uneconomic quantities required by villages or the high transport cost. Thirdly, there is a case for government interventions due to externalities such as in soil conservation or animal health where the actions of one farmer in not undertaking preventive measures can have an adverse effect on other farmers or the society as a whole.

In general, the Action Plan is drawn up to provide for government programs primarily to facilitate and/or regulate productive activities in the interests of the producers and consumers. Such programs are many and varied such as meat inspection or agricultural product grading and classification systems. Also, much emphasis has been placed on rural infrastructure and of agricultural support services. The Action Plan also takes in consideration the demand for programs for introduction of new cultivation techniques, such as introduction of a fish fingerlings or an improved paddy seed program. Also the Action Plan promotes programs due to market failure and for externalities such as shifting cultivation stabilization or watershed management and agro forestry programs.

In a market economy, control of prices and subsidies on inputs or outputs are gradually eliminated. Controlled or regulated prices give wrong signals to producers and consumers, leading to either over production or under production and the same applies for consumption. Private enterprise is expected to provide all farm input services as well as produce, market and process all farm outputs as well as other agricultural services. Agro processing is a private sector activity. On the trade front, the market economy also implies a move towards freer trade within and outside national boundaries. AFTA accession and recent government initiatives in tariff reduction are positive actions in this regard.

## 5.3 Framework of Agricultural Development

### 5.3.1 Demographic Framework

Development objectives are closely linked to the demographic framework as the target of US\$885 per capita (in 2000 constant prices) by 2020 is dependent on the rate of population growth. A higher rate of population growth of 1.0% means that GDP at 2000 constant terms would have to increase by 137 billion Kip or US\$16.7 million a year and to that extent makes it more difficult to achieve the goal by 2020.

#### (1) Population Growth Scenarios

The National Statistical Office has three population projections to the year 2020 as follows:

**Table 5.1 Assessment of Population Growth**

	2000	2005	2010	2015	2020
Scenario 1	5.200	5.900	6.800	7.700	8.700
Scenario 2	5.100	5.800	6.400	7.100	7.700
Scenario 3	5.234	5.921	6.651	7.415	8.207

Unit: Million

Source: National Statistical Center.

Scenario 1 assumes a continuation of present fertility and mortality levels. In Scenario 2 a moderate decline in fertility and some improvement in mortality is assumed and the decline in population growth is rapid. Scenario 3 is between Scenario 1 and Scenario 2 and assumes a decline in the rate of population from the current 2.60% down to 2.35% by 2010 and 2.05% by 2020.

#### (2) Rural Urban Population Scenario

Current estimates are for the urban population growth rate to move ahead of the country's rate of population growth due to rural-urban migration. There will be a gradually shift in population mix and it is projected that the rural sector would account for 80% of the population in 2020 as seen below:

**Table 5.2 Rural, Urban and Total Population Projection to 2020**

	1995	2000	2005	2010	2015	2020
Rural	3.832	4.344	4.891	5.456	6.018	6.571
Urban	0.782	0.889	1.030	1.194	1.397	1.635
TOTAL	4.612	5.234	5.921	6.651	7.415	8.207

NSC and JICA Study Team Estimate based on a 3.0% urban growth to 2010 and 3.2% growth from 2011 to 2020.

**Table 5.3 Projection of Relative Share of Urban-Rural Population**

	1995	2000	2005	2010	2015	2020
Rural	83.1	83.0	82.6	82.0	81.1	80.0
Urban	16.9	17.0	17.4	18.0	18.9	20.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Derived from above table.

The crucial needs are to redress zonal imbalances between the sloping land and flat land areas and to allocate the resources and priorities toward accelerating the integration of the sloping land areas into the national economy while maintaining the pace of market driven growth along the Mekong. The main priorities are to sustain the pace of the current economic momentum along the Mekong corridor, while expanding the development process in the sloping lands. There is a critical need for Government support in the sloping lands to redress market failure and externalities which inhibit growth and development of the rural sector.

### 5.3.2 Macroeconomic Framework

#### (1) Basic Concept

The basic concept is that Lao PDR is committed to a development goal and that development will take place in all sectors of the economy, although the rates of growth of individual sectors may vary. The major national goal is for the Lao PDR economy, in aggregate, to grow at a rate to reach a target of US\$ 885 per capita in 2000 constant prices by the year 2020. This target is dependent not only on the performance of the individual sectors but also on the rate of population growth as well as the US dollar/Lao PDR Kip exchange rate. A higher rate of population growth can impact negatively on the achievement of the overall target. The target is expressed in US \$ by the DAC and this could also have a bearing on the achievement of the target. The agriculture sector accounts for more than half of national GDP and would therefore make a significant contribution to the achievement of this GDP target.

#### (2) Data Sources

GDP data published by official sources are given in 1990 base year prices. Many changes have taken place since then in the general level of prices as well as in exchange rate parities. For the purpose of the analyses in the Action Plan it was necessary to convert the 1990 base year prices to 1999 constant prices by using deflators on a sectoral basis for each year from 1991-1999. The estimation as well as the deflators used are presented in Appendix 2.

#### (3) GDP Growth Scenarios

##### Scenario 1

As the overall target was related to the rate of growth of the economy, it was initially necessary to assess how the national growth target compared with the growth of the economy in recent years. The first scenario therefore attempts to establish what the outcome would be in relation to the 2020 target if the economy continues as it had done in the past five years. It is assumed that the

growth rates for the five years 1994-99 for the major sectors would continue through to 2020 and that the rate of population growth would also continue as in the recent past. The rates of growth for the three major sectors of agriculture, industry and services for the five-year period were 4.8%, 11.0% and 7.7% respectively and the rate of population growth was 2.6%. These growth rates were used in scenario 1. The average annual growth rate for the economy for the same period in 1999 constant prices was 4.8%.

Scenario 1 indicates that per capita income would reach only US\$ 707 in 1999 constant prices and present exchange rates, or a shortfall of around 25% if the present rates of growth continue into the future. This implies that there is a need to sharply increase the rate of growth of the economy for the next 20 years if the target is to be achieved. As agriculture is the major sector, this means that the rate of growth of agriculture experienced in 1994-99 of 4.6% per year also needs to be stepped up substantially. In the Medium Term Expenditure Framework presented by Government to the 7<sup>th</sup> Roundtable Meeting in November 2000, the rate of growth of the agriculture sector in the medium term was targeted at 4.4% per annum. However, in the Vision on Agriculture and Forestry Development until 2020, the target growth rate for Agriculture sector was 5.8% per annum for 2000-2010 and 7.3 % for 2011-2020.

**Table 5.4 Scenario 1: GDP Projection by Main Sectors**

(unit: million kip)

	Growth Rate	2000	2005	2010	2015	2020
Agriculture	4.8%	5,807,545	7,341,741	9,281,228	11,733,075	14,832,634
Industry	11.0%	2,589,640	4,363,694	7,353,078	12,390,364	20,878,484
Services	7.7%	2,608,455	3,779,740	5,476,971	7,936,316	11,499,990
Import Duties	0.73%	80,341	113,042	161,412	234,036	344,641
<b>TOTAL</b>		<b>11,085,982</b>	<b>15,598,216</b>	<b>22,272,689</b>	<b>32,293,791</b>	<b>47,555,791</b>
Population	2.6%	5.193	5.916	6.752	7.694	8.738
GDP Per Capita		2,134,793	2,636,615	3,298,680	4,197,269	5,442,407
<b>GDP Per Capita (US\$)</b>		<b>277</b>	<b>342</b>	<b>428</b>	<b>545</b>	<b>707</b>

Notes: Exchange Rate of US\$ = 8,220 kip, the rate on January, 2001.

### Scenario 2

The next scenario was to determine what rates of growth were required for each of the major sectors and the economy as a whole to achieve the target of US\$ 885 per capita in 2020 in 2000 constant prices. It was assumed that the rate of population growth would decline gradually from the present 2.6 % to 2.35% by 2010 and to 2.05% by the year 2020. This is the most likely scenario according to the National Statistics Bureau.

The results show that GDP for the country as a whole would have to grow at an annual average growth of 8.9% to 2020. This is a very high rate and has not been achieved in recent years. The average rate of growth for the period 1994-99 in 1999 prices was only 4.6% per year. This means that growth rates for the economy as a whole have to be almost twice as much as during that period when rice production, the major item of growth recorded substantial growth. The result of this scenario also implies that the agriculture sector, which contributes over half of national GDP, would have to grow at an even faster rate than the national average of 8.9%, unless there is spectacular growth in the industry and services sectors.

**Table 5.5 Scenario 2: GDP Projections by Main Sectors to Reach US\$ 885/year by 2020**

(unit: million kip)

	2000	2005	2010	2015	2020
Agriculture	3,909,230	5,641,898	8,875,084	13,878,840	21,493,246
Industry	4,452,179	6,425,495	10,107,735	15,806,457	24,478,419
Services	2,497,564	3,605,546	5,670,192	8,867,036	13,731,796
Import Duties	78,074	116,577	172,815	254,341	371,564
<b>TOTAL</b>	<b>10,858,973</b>	<b>15,671,940</b>	<b>24,653,013</b>	<b>38,552,334</b>	<b>59,703,463</b>
Population	5.234	5.921	6.650	7.415	8.207
GDP Per Capita	2,074,699	2,648,840	3,707,220	5,195,190	7,274,700
<b>GDP Per Capita (US\$)</b>	<b>252</b>	<b>322</b>	<b>451</b>	<b>632</b>	<b>885</b>

Notes: Exchange Rate of US\$ = 8,220 kip, the rate on January, 2001.

#### (4) Public Investment Scenario

At present, government goals for public sector investment are based on specified macro economic indicators based on rate of growth of GDP. On this basis, and using the government GDP shares in sectoral public sector investment, an estimate is made of the public sector investment or the resource envelope under which the proposed Action Plan would be implemented. The proposed Public Investment Program (PIP) for agriculture is estimated for each five year period to 2020 based on the assumption that growth rates in GDP are in line with the achievement of the target of \$885 per capita by 2020 as follows.

**Table 5.6 Estimated Resource Availability for the Action Plan for Agriculture 2000-2020**

	2000	2005	2010	2015	2020
GDP (Million Kip)	10,858,973	15,671,940	24,653,01	38,552,334	59,703,463
Per Capita Income (Kip)	2,074,699	2,646,840	3,707,220	5,195,190	7,274,700
Per capita Income (US \$)	252	322	451	632	885
Public Investment Program (PIP)	1,303,077	1,880,633	2,958,362	4,626,280	7,164,416
Agriculture Share of PIP (including Forestry)(mill. Kip)	234,554	338,514	532,505	832,730	1,289,595
Adjustment for Forestry	3,753	5,416	8,520	13,324	20,634
Agriculture Share of PIP	230,801	333,098	523,985	819,407	1,268,961
Agriculture Proposed Capital Budget	184,641	166,549	261,992	409,703	634,481
Agriculture Proposed Recurrent Budget	46,160	166,549	261,992	409,703	634,481

Notes: 1) GDP per capita income to achieve US\$ 885 in 2000 prices in 2020

2) PIP is 12% of GDP.

3) Agriculture share of PIP is 18%

4) Capital Expenditure share is 80% in 2000 and down to 50% after 2005.

5) All expressed in 1999 constant prices.

On the basis of the assumption that the target would be achieved by 2020, the Public Investment Program for the Agriculture sector (excluding Forestry sub-sector) has been estimated in 2000 constant prices and would increase from 231 million kip in 2000 to 1,269 million kip by the year 2020. The actual PIP from 1995-96 to 1999-2000 and the planned PIP for 2001-02 and 2002-2003 are also provided in the following table for ease of comparison. It is noted that the actual PIP for the agriculture sector in 1999-2000 of 213 billion kip is very close to the target derived from the projection as seen in the table below.

**Table 5.7 Actual and Planned PIP Total and Agriculture 1995/96 - 2002/2003**

(unit: billion kip)

	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03
	Actual	Actual	Actual	Actual	Actual	Planned	Planned	Planned
Total	205.4	264.4	589.6	908	1,701	2,005	2,500	2,800
Agriculture	23.4	34.0	128.9	120	213	470	475	504
Agriculture share (%)	11.39%	12.86%	21.86%	13.2%	12.5%	23.4%	19.0%	18.0%

Source: Government report to the 7th Roundtable Meeting, November 2000

The projections were also made for the target PIP for agriculture on the assumption that there would achieve the target GDP per capita of US\$885 in 2020.

**Table 5.8 Required PIP for Agriculture for Achievement of Target of \$ 885: Annual Target Agriculture PIP from 2002-2010 (excluding forestry)**

	2002	2003	2004	2005	2006	2007	2008	2009	2010
US\$ mill	26.7	28.7	30.9	33.3	36.4	39.9	43.7	47.8	52.4
Billion Kip	220	236	254	274	300	328	359	393	431

Note: In constant 2000 prices



### 5.3.3 Policy Framework

While much progress has been made since 1986 in the move to a market economy, the enabling environment for agricultural development is in need of further improvement. The policy framework needs to be modified to enhance the incentive structure to move out of subsistence to a market-oriented agriculture.

#### (1) Removal of Public Sector Interventions

There are several non-transparent domestic and international trade restrictions and government interventions in input markets, especially in fertilizers, seedlings and in rural finance. There are also numerous licensing requirements, permits, controls and procedures on transactions. There are also unclear land policies, presence of government owned monopolies in productive enterprises (forestry) and supply enterprises (animal vaccines and seeds) and lack of full privatization of some state owned enterprises. These discourage private investment because of uneven competition. Foreign investment procedures appear to be cumbersome and time consuming and often, confusing.

#### (2) Removal of Market Distortions in Rural Credit Markets

A major market distortion is in rural credit markets. Only 11% of farmers obtain credit from institutional sources. The Agricultural Promotion Bank through heavily subsidized credit, soft recovery conditions and subsidized procurement causes several distortions in agricultural lending and input markets and acts as a disincentive to private sector activity. APB also imports fertilizer, hand tractors and farm equipment.

#### (3) Policy on Rice Self Sufficiency

Government policy on rice self sufficiency has been very costly to the country and requires heavy budget subsidies on irrigation and credit. Maximizing rice production through subsidies provides low returns to farmers as it diverts resources away from potential higher value crops and export crops.

#### (4) Poor Functioning of Land Market

There is a lack of a well functioning market for land. Land tenure policies constrain private investment in the rural sector. Security of tenure is critical for investment but all land is owned and administered by the State but leased to farmers. The lack of a nationwide land registration system acts as a disincentive to improvements, particularly of a capital nature on farms.

#### (5) Lack of Consistency/Non Conformity in Donor Assisted Projects

There has been poor coordination of donor-assisted projects resulting in conflicting policies being pursued in different districts and provinces. Fertilizers and seeds are made available to farmers through different projects at different subsidized prices. At the same time, the private sector is also in the market as a seller in competition, though at higher prices. This not only gives wrong market signals but also kills private sector initiatives. There is an urgent need to coordinate input and output supply and price policies of donor-assisted projects. This could be done by revision of the guidelines for donor-assisted projects and a strict enforcement of these guidelines.

#### 5.3.4 Role of the Private Sector in Action Plan

The transition to a market economy means that the private sector would play an increasingly greater role as government gradually withdraws from economic activities hitherto undertaken in the supply of farm inputs and services; in the marketing of outputs and in agro-processing activities. This private sector role is important in the context of the overarching goal of increasing value added as all activities from farm gate to consumer help to achieve this. In order for the market to work efficiently and provide the right signals to producers, consumers and agribusiness operators, it would be essential to provide an enabling environment for the private sector. This means clear and unambiguous regulatory services as well as constructive and action oriented facilitation services.

The private operators are expected to play an important role in the supply of inputs, particularly improved seed, fertilizers and agro-chemicals as well as rural financial services. Private operators are also important in the role they play in the purchase of produce from farmers and in transport, storage, and processing and in the whole range of activities in moving produce from farmer to consumer, whether in the domestic or export market. This means that the government has an important role in the transition to a market economy to provide an enabling environment for investment decisions in all agribusiness activities. The private sector operators should also be provided with a level playing field without public sector subsidized competition, especially in the provision of farm inputs, including credit, in agro processing activities and in regulated purchase pricing.

The private sector role can extend beyond these, especially in the area of farmer education. In several countries, private companies, particularly seed and agro-chemical companies perform useful function in educating farmer on appropriate cultivation technologies for use of improved seeds, use of fertilizers and chemicals

and associated farming practices This is also likely to gain ground in Lao PDR provided the enabling environment is in place.

#### **5.4 Approach to Program/Project in Action Plan**

Within this overall market economy conceptual framework, the Action Plan also followed some approaches to: (i) redress some public sector investment imbalances witnessed in recent years; and (ii) remedy some of the basic shortcomings in implementation capacity or clearly perceived priorities for achieving higher levels of returns on investment. The following guidelines were followed in formulation.

##### Phasing of Investments

Project and program investments were to be phased out over a nineteen-year period of the Action Plan. This requires a review of the several factors such as the natural and human resource base, readiness of the agricultural sub-sector for changes, availability of skilled staff, availability and timing of foreign assistance and other related factors. The timing of returns on project and program investments can vary from one project to another. In human resource development programs, the timing and duration of the 'learning curve' is an important determinant of the timing of the stream of returns. In projects involving a construction period, the gestation period between inputs and optimum output is an important consideration. In addition, the complementarity of related programs or interdependence of programs is also an important factor. For example, a vegetable cultivation technology research project needs to precede a vegetable production promotion project. Adaptive research programs need to be undertaken before the research results could be applied by extension workers to demonstration plots or farmer's fields. All these known factors were considered in the formulation of the projects and programs in the Action Plan.

##### Policy Framework

The policy framework should provide an enabling environment for agriculture development and government should take early action for removing distortions such as regulations, controls, licensing and reduction/elimination of subsidies. There should also be a market driven incentive structure for farmers. The agribusiness sector should also be provided with a level playing field by removing all distortions in the market such as subsidized credit and fertilizer. Distortions in factor markets also need to be addressed at an early stage, especially in the area of rural finance and in land.

### Public Investment Program Capital Expenditure Imbalance

Several recent government reports made reference to the imbalance between capital and recurrent expenditures in the PIP. This was partly due to an over-emphasis on capital development works by many large donors. The ratio of capital to recurrent expenditure in 1997-98 and 1998-99 was as high as 94:6. It has now been recognized that this should be changed and the Seventh Roundtable (November 2000) documents indicated a target ratio of 50:50 by 2004. This ratio should be maintained at least through the period of the Action Plan.

### Sub-Sector Budgetary Allocation Pattern

Past public expenditure patterns indicate that some sub-sectors within agriculture have received relatively high budget allocations such as in irrigation and forestry while others have received small allocations relative to the size of the economic activity. For example, the livestock sub-sector received only 4% of the agricultural budget in recent years although it contributed over one-third of agricultural GDP while diseases, parasites and poor nutrition keep both livestock productivity and exports well below potential. The Action Plan would redress this budgetary imbalance and provide a greater allocation for sub-sectors that show greater potential for growth such as livestock fisheries and agro-forestry.

### High Return –Quick Yielding Activities

High priority is being given to programs that provide a high return in a short period of years. In this category are production and distribution of improved paddy seed and animal health programs. These activities show a very high return on investment in other Asian countries and such activities can impact on production in two or three years. These activities could be undertaken at relatively low budgetary cost and in partnership with the private sector. Research by IRRI on farmer's fields indicates that improved paddy seed alone results in a 15-20% increase in yields. Programs for improved seed for paddy and distribution should be undertaken in the first year of the Action Plan which should include a sizeable expansion of the capacity of government research stations to produce required quantities of foundation seeds.

### Project Implementation Capacity

The Action Plan is also placing emphasis on the planning, monitoring and evaluation capability at the provincial and district level. Intensive training programs need to be introduced to enable provincial and district staff to undertake project formulation and implementation. In view of the recent decentralization and increased share of the annual budget being transferred to provinces, staff resources and training receives high priority in the Action Plan.

Many projects suffer in implementation due to lack of trained and qualified staff and a high priority is to provide training to new recruits and existing staff working either directly or indirectly with the farming community. As recruitment and training is likely to take a few years, training of trainers would be taken up initially. High priority would be given to training adequate numbers of extension and research staff as well as staff engaged in animal health and agro forestry programs.

#### Center Provincial Revenue Sharing Activities

The existing revenue sharing arrangements between the center and provinces do not provide sufficient incentive for the provinces to collect additional revenues. The Government introduced a new revenue sharing arrangement in 1998/99. Provinces with budget surplus are now permitted to retain 50% of tax collection above revenue targets for projects approved by Central Government. Provinces not in surplus are given a fixed transfer from the center, and must collect the balance of their budget spending. Experience indicates some weakness in these tax-sharing arrangements. It does not provide provinces, in particular those in surplus, with strong incentives to exceed pre-assigned targets because the extra revenue they raise cannot be spent on provincial priorities. The classification of provinces into one of three types is not stable from year to year and is based on historical tax collection in each province. Since surplus provinces have the highest obligations to the center, an incentive exists for the provinces not to exceed their pre-assigned targets and thus avoid being classified as a surplus province. These revenue sharing arrangements need early review.

#### Organizational and Administrative Capacity of MAF

The lack of adequate organizational and administrative capacity for implementation of projects and programs has been a major stumbling block and the strengthening of the Ministry of Agriculture and Forestry, the Planning Department, the Aid Coordination and implementation capacity is to be given high priority.

#### Extension Services

Extension services provide a high return on investment as is evidenced by studies in Asian countries. However, there is a time lag in recruitment of staff and training. In spite of this, extension is a high priority and should be taken up early. This should go side by side with adaptive research trials and demonstration plots on farmer's fields.

### Improvement of Infrastructure Facilities

Improvement of infrastructure facilities, particularly the rural road network is a high priority. Studies in Asian countries indicate a very high return on investment in rural and farm to market roads. Construction and rehabilitation is time consuming and should be commenced early if the results of other programs, particularly extension and better animal health services are to impact on output. Farmers should have good access to inputs and markets for output. Most of these road construction and rehabilitation programs are within the purview of other agencies and there is a need for close coordination to ensure that the programs are dove-tailed with other high priority programs.

### Emphasis on Irrigation Management

Increased irrigation water at the farm is a high priority. There have been very large investments in irrigation in recent years but the efficiency of the delivery of water to the farmers is very low. Priority is placed on improving the efficiency of the irrigation system per unit of production. Major emphasis is on rehabilitation of existing schemes and on formation and training of farmer organizations such as water users associations and community managed irrigation systems. The need for new irrigation works could be reviewed after 2005.

### Rural Finance and Credit

There is a need to strengthen the Agricultural Promotion Bank and the State Owned Commercial Banks (SOCB's) to give these a more commercial orientation and make credit available to the farmers. The operating and lending procedures should be streamlined to increase their capacity to compete in the rural sector through active mobilization of savings and loan products tailored to meet farmer needs. While multi-laterals continue to assist in this regard, much needs to be done. In addition, micro finance structures that support savings and credit groups should be supported and the legal framework for their operations and necessary legal safeguards established.

### Commercial Crops

Government strategy as outlined in the Vision is to move rapidly towards diversification and increased production of commercial crops. Emphasis is being placed on a vigorous research and promotion program to encourage market determined product development where there is clear demonstration of comparative advantage. The public sector is expected to work closely with the private sector in this area.

### Agro-Forestry, NTFP and Related Livelihood Activities

In the sloping area or remote area, the road network development is most important as mentioned above. Those areas have limited potential for crop agriculture due to steep topographic condition. In addition to road network, therefore, agro-forestry, NTFP and off-farm income activities such as sericulture, weaving, paper making should be developed and promoted on area specific bases for diversification and enhancement of household income in those areas. The concerned research and promotion program should be put high priority.

### Trade Liberalization

In keeping with Government policy on trade liberalization as outlined in the Strategic Vision for Agriculture, continuous reviews should be undertaken in concert with parallel actions by trading partners to lower tariffs on a range of agricultural commodities by placing these on the Common Effective Preferential Tariff Inclusion List. Recent actions in this regard are positive steps towards freer trade.

### Food Security and Rice Output

Lao PDR is nearly self-sufficient in rice, and its supply and demand would be in balance for about next 10 years as projected in Sub-section 3.2.5 (7). In order to keep the present balance, however, unit yield of paddy should be increased up to an appropriate level that maximizes farmers' income. For lowland paddy, this would be achieved with some measures including distribution of improved seed, improvement of cultivation technologies and effective use of the existing irrigation systems. In case of upland rice, unit yield increase would be achieved with parallel actions to be taken for the stabilization of shifting cultivation. In this context, relevant research activities should be strengthened.

### Poverty Alleviation

The Action Plan does not specifically address nor formulate specific poverty alleviation programs or "safety nets". This is because the Action Plan should cover all agriculture, livestock and fisheries development and the primary focus is not on poverty. However, all of the components of the Action Plan, particularly those relating to food production, livestock development and animal health, rural finance, rural roads as well as agro-support services should be designed to address poverty alleviation, albeit indirectly.

## 5.5 Area Based Agricultural and Rural Development

### 5.5.1 Introduction

This sub-section discusses the proposed direction for agricultural development in each area/region. Taking all the results of assessments as presented in Chapter 4 into consideration, i.e. regional agricultural setting, agricultural potentials, availability of potentially new agricultural land, and priority for removal of UXOs, the Lao PDR is largely divided into four agricultural development areas: (i) northern and upland and highland areas; (ii) Vientiane plains; (iii) central and southern areas; and (iv) Boloven plateau. The northern upland and highland areas and central and southern areas have some sub-areas. These classification is presented below.

Area Classification	Sub-area Classification
1) Northern Upland and Highland Areas	Lowland Paddy Areas
	Sparsely Populated Remote Areas
	Borderland Areas
	Areas other than the above three areas
2) Vientiane Plain	
3) Central and Southern Areas	Central and Southern Mekong Corridor
	Central and Southern Upland and Highland Areas
4) Boloven Plateau	

The above classification is shown in Figure 5.1. The proposed development approach and direction for each area is mentioned below.

### 5.5.2 Northern Upland and Highland Areas

#### (1) Overall Direction

In these areas, Groups-1 and -2 are predominant according to the grouping results in Section 4.2. This area extends beyond the Northern Region, and most districts in Vientiane, Xaisomboun, Xiangkhouang and Borikhamxai provinces are included in the Northern Upland and Highland Mountain Areas (see Figure 5.1). The Northern Region is generally defined as the seven provinces of Phongsali, Louangnamtha, Bokeo, Oudomxai, Louangphrabang, Houaphan and Xaignabouri.

Shifting cultivation, having a considerable negative impact on the land and forest, is widely practiced. It is expected that such a negative impact may expand in future as a result of increased population pressure. Accordingly, taking measures to stabilize shifting cultivation is seen as critical for agricultural development in this area. Among others, fundamental measures to be taken for shifting cultivation stabilization include the development of alternative production systems through the strengthening of research efforts and the dissemination of such systems to farmers



through reinforcing extension services. Another fundamental measure is to provide an adequate rural road network in shifting cultivation areas. This would significantly improve accessibility, and increase the sale of agricultural produce.

These fundamental measures require considerable investment over a long time period. Therefore, other measures are needed to improve the farming economy in the short run. These include strengthening the livestock sub-sector by supplying intensive animal health care services, promoting feed crop production and providing micro-finance to support the procurement of farmers' production inputs, etc.

Since shifting cultivation expansion is closely related to increased population pressure, the above mentioned measures have to be taken paying attention to the availability of potential agricultural land. In this context, such availability is analyzed on a per-farm household basis for each district as shown in Figure 4.8. As a result, the average availability of potential land is negative in 27 districts. It is evaluated that farmers in these districts are invading forest land and/or UXO risk areas for farming purposes. Such districts are listed in Table 4.8.

As shown in Figure 4.8, there are several districts with high priority for UXO removal in the Northern Upland and Highland Mountain Areas. These districts are concentrated in the provinces of Xiangkhouang, Louangphrabang and Xaisomboun. However, there is only one district classified as having the highest priority, although there are many highest priority districts in the Central and Southern Area.

## (2) Lowland Paddy Areas in Northern Upland and Highland Areas

Although it is relatively small, lowland paddy areas are developed in the Northern Upland and Highland Mountain Areas mainly in valley bottoms. Thus, paddy production, together with upland paddy, plays a very important role in food security. The proposed direction for agricultural development would be basically the same as that in the Central and Southern Lowland Areas described in Sub-section 5.5.4, e.g. the distribution of improved seed, improvement of cultivation techniques, rehabilitation or improvement of existing irrigation systems and its effective management, etc. In addition, it is proposed to take measures to further promote fishculture that would be beneficial in terms of farmers' nutrition improvement and income diversification.

### (3) Sparsely Populated Remote Areas

There are many districts/villages in remote rural areas in which the development of rural infrastructure is usually difficult in the light of its low economic potential. Such districts/villages are found particularly in Phongsaly, Louangnamtha and Oudomxai provinces. In these provinces, agricultural development covering a large number of districts/villages would be difficult. It is, therefore, proposed to develop such areas through the pocket development approach. This approach will create growth points in remote areas by concentrating the investment for developing rural infrastructure and other services. This concept is similar to that of the focal site approach for the rural development. In the proposed approach, however, economic development is more focused, although it is not always taken into account in the focal site approach and more attention is paid for the poverty alleviation.

### (4) Borderland Areas

The result of the grouping in Section 4.2 reveals that two districts in the southern part of Xaignabouri have a high degree of market orientation (see Figure 4.1). This is mainly because of commercial cotton production grown for the Thai market. Another example is sugar cane produced in Phongsaly province for Southern China, although the scale is still small. Because of its geographical advantage, it is judged that borderland areas have a high potential for commercial production for export to neighboring countries. However, the export potential of many crops is still unknown. It is, therefore, proposed to conduct a market study in order to determine promising export products. Promoting commercial production for export would be based on the results of such market studies. Moreover, private sector investment in agro-processing has to be promoted in parallel. In this context, market information has to be supplied both to the producers and the traders. This should be an important step to attract commercial production and private sector investment. An efficient system of making such market information available is thus needed.

#### 5.5.3 Vientiane Plain

This area is classified as Group-5 and-7 according to the grouping result described in Section 4.2. It involves the whole of Vientiane municipality, four districts in the south-eastern part of Vientiane province, and two districts in the eastern part of Borikhamxai province (see Figure 4.1). In this area, vegetables for Vientiane City are intensively produced particularly in the dry season. Although it is still on a small scale, vegetable production in the wet season is on an increasing trend. In this area, however, flooding is one of the largest constraints to agricultural development. Floods occur frequently in the wet season along the Namgum River due to its

topographic condition. The flooded area is considerable, covering about 10% of the eastern part of Vientiane municipality. Wet season agricultural production is difficult in such areas, although the largest market is close by. Some flood mitigation measures in the mid- to long-term are thus needed. In this context, it is proposed to undertake a study for flood mitigation measures as soon as possible. In this study, technical and economic considerations would be taken into account.

On the other hand, vegetable production should be strengthened in non-flood areas. It can be expanded, if proper measures are taken. These would include the introduction of new vegetable crops and varieties, cheaper plant management and quality control technologies and appropriate technologies for all year round crop production. Research should be strengthened in order to develop technologies covering the above fields. At the same time, a market study and market information supply system both similar to that explained in Sub-section 5.5.2 (4) are needed in this zone.

Lowland paddy production is also practiced in this area, particularly in the suburbs of Vientiane municipality. The proposed direction for its development is the same as that for the Central and Southern Lowland Areas described later. In addition, the advantage of the suburbs should be fully utilized to promote secondary crops, fishculture and small animal rearing.

#### 5.5.4 Central and Southern Areas

##### (1) Central and Southern Mekong Corridor

These areas are classified as Group-3 and -4 according to the grouping result, and extend along the Mekong Corridor where lowland paddy is predominant in the flatlands and/or terraces (see Figure 4.1). The provinces in Group-3 and -4 are Khammouan, Savannakhet, Saravan, Champasak and Attapu. The potential for agricultural development is very high. The reasons are; (i) the national Route 13 road runs from the north to the south in this area; (ii) this area will become a trade route for Thailand and Vietnam after up-grading Route 9 and building a bridge at Savannakhet; (iii) labor availability is better than other areas having a higher population density.

The important issues for agricultural development include: (i) strengthening of paddy production; (ii) diversification of paddy based agriculture; and (iii) promotion of market orientated agriculture. The strengthening of paddy production should be achieved through the distribution of improved seed, improvement of technology of plant management and effective use of the existing irrigation systems. Among

others, recommended varieties and production technologies for lowland paddy have been developed over 10 years or more through the efforts of the Lao-IRRI project. However, extension services for production and distribution of improved seed and the dissemination of recommended production technologies are still generally weak. Such weaknesses should be overcome through the strengthening of extension services. To a certain extent, the diversification of agricultural produce is advanced, and livestock raising and garden vegetable production for home consumption are widely practiced. In paddy areas, however, crop diversification is poor with rice predominant. The issues for crop diversification are: (i) difficulty in marketing of non-paddy crops; (ii) lack of new crops and varieties for the extension; (iii) lack of production technologies for non-paddy crops; (iv) lack of a proper agriculture extension service; and (v) lack of rural finance for the procurement of inputs. Therefore, measures needed to solve the above problems include: (i) provision of rural roads; (ii) supply of market information; and (iii) strengthening of research, extension, and financial services. Similar measures would also be needed for the promotion of market oriented agriculture. In addition, farmers' cooperatives are required to handle sales of products and the purchase of inputs. To develop market oriented agriculture, the improvement and development of a good marketing system is indispensable. The farmers should play a leading role in such a marketing system by organizing themselves into farmer groups, otherwise they would have little access to cheaper inputs and reasonable prices for produce sales.

The districts with high population pressures are presented in Figure 4.7 and Table 4.8. These districts would have priority when the above-proposed measures are adopted, because the number of beneficiaries is large in the implementation of proposed projects/programs. However, special attention should be paid to the districts/villages that suffer flood damage in the wet season. For such districts/villages, a study of flood mitigation measures is required so as to know the technical and economic feasibility for mitigation.

As shown in Figure 4.8, the districts with higher priority for UXO elimination are concentrated in Saravan, Savannakhet and Khammouan provinces. Such districts should also be taken into account when the above-proposed measures are adopted.

## (2) Central and Southern Upland and Highland Areas

These areas are classified as Group-1 and -6 according to the grouping result, and extended along the border of Lao-Vietnam where foothills and mountains are predominant (see Figure 4.1). The related provinces are Khammouan, Savannakhet,

Saravan, Champasak and Attapu. The direction of agriculture development is basically the same as that in the Northern Upland and Highland Mountain Areas.

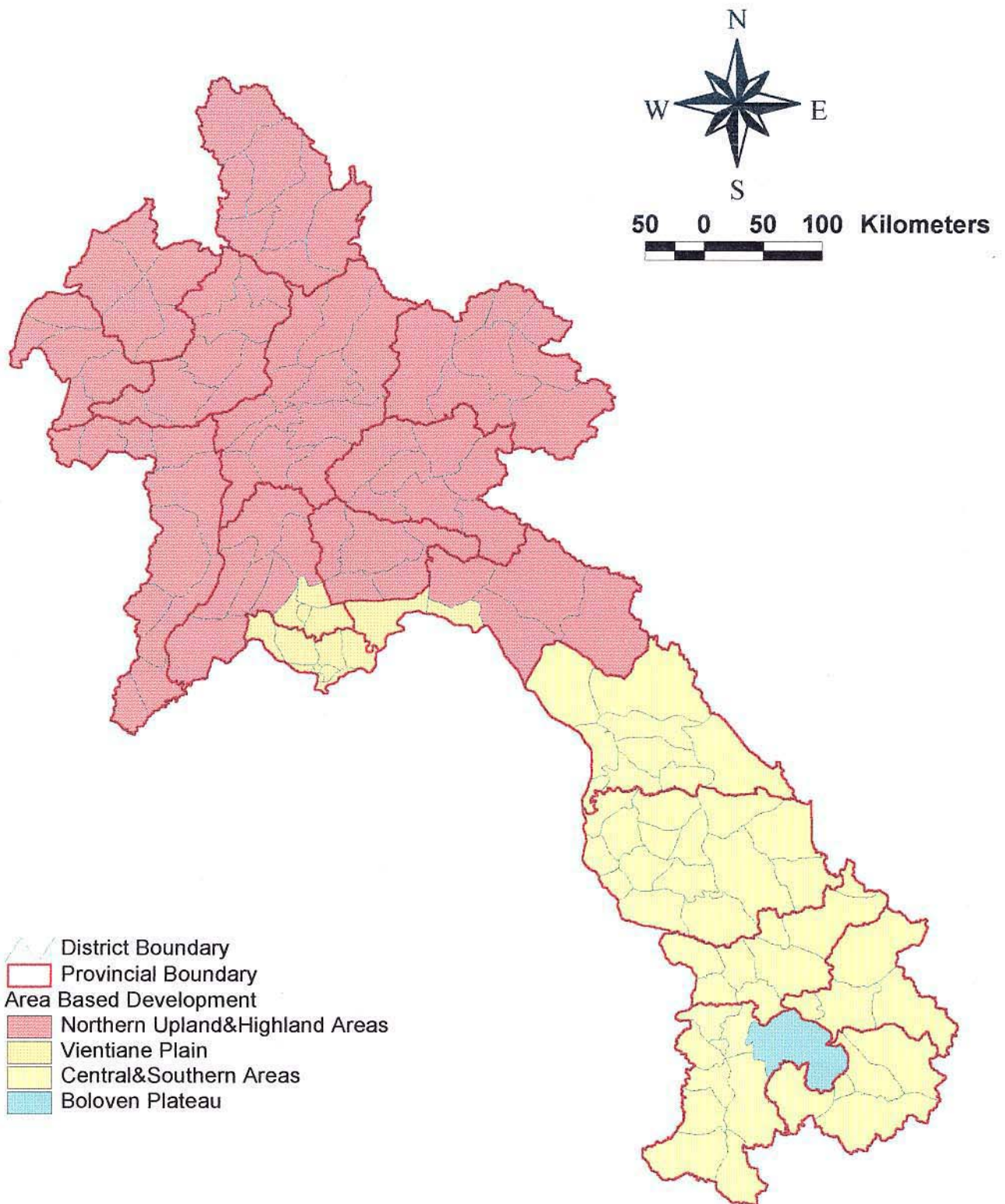
A characteristic of this zone is the relatively large area of forestland and a significant UXO risk when opening up land for agriculture. Because of these characteristics, the availability of potential agricultural land per farm household is small in many districts as shown in Figure 4.7, and its figures are negative in seven districts as shown in Table 4.8. The distribution of these districts is two in Khammouan, two in Savannakhet, one in Saravan, and two in Xekong province. These districts should give priority to the stabilization of shifting cultivation.

#### 5.5.5 Boloven Plateau

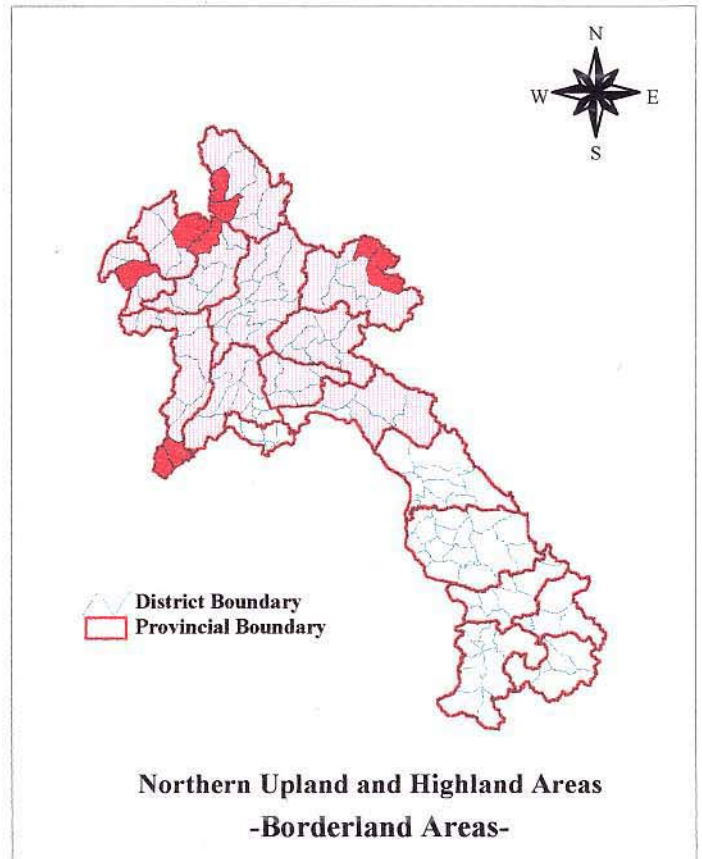
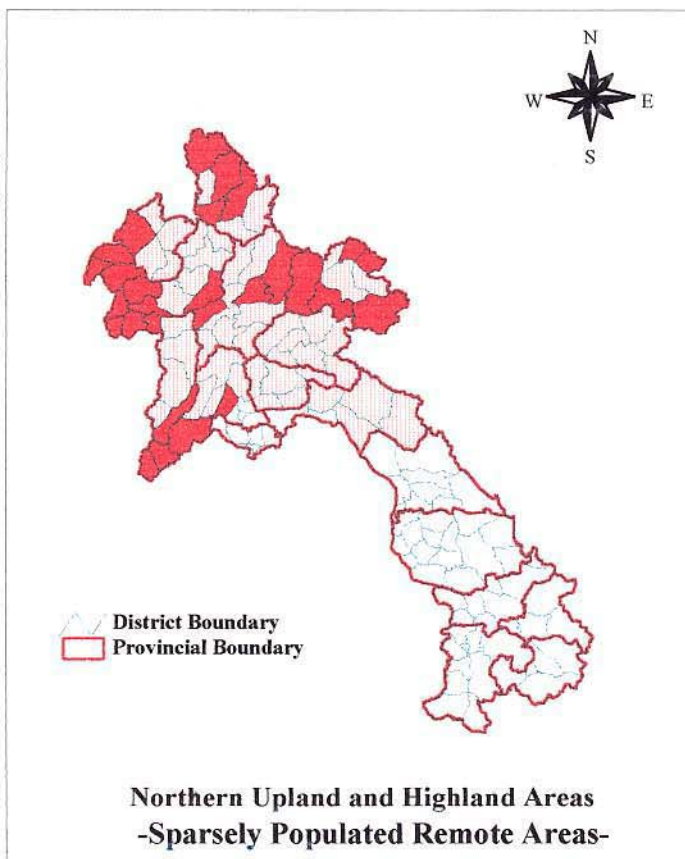
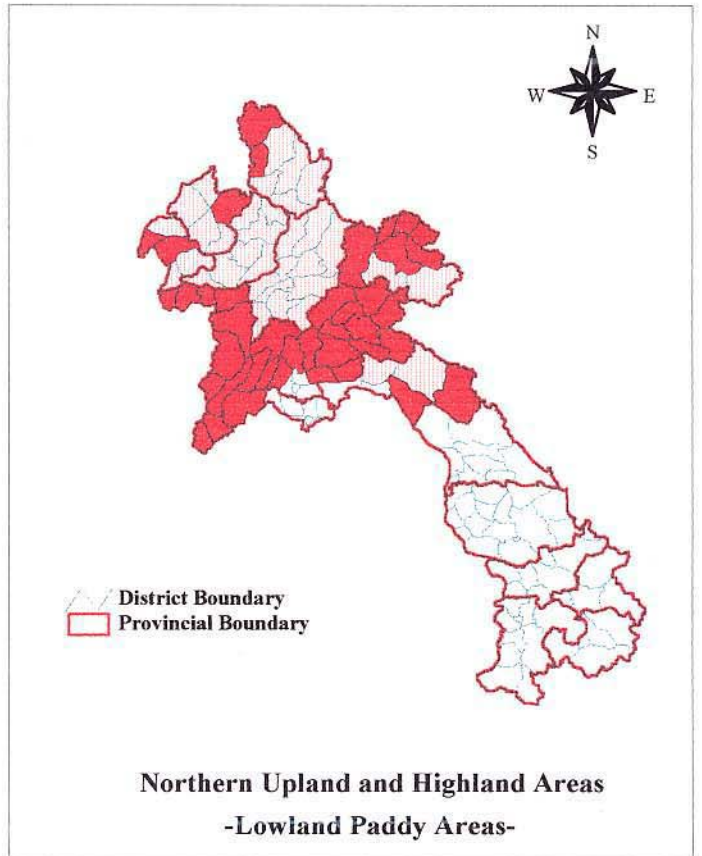
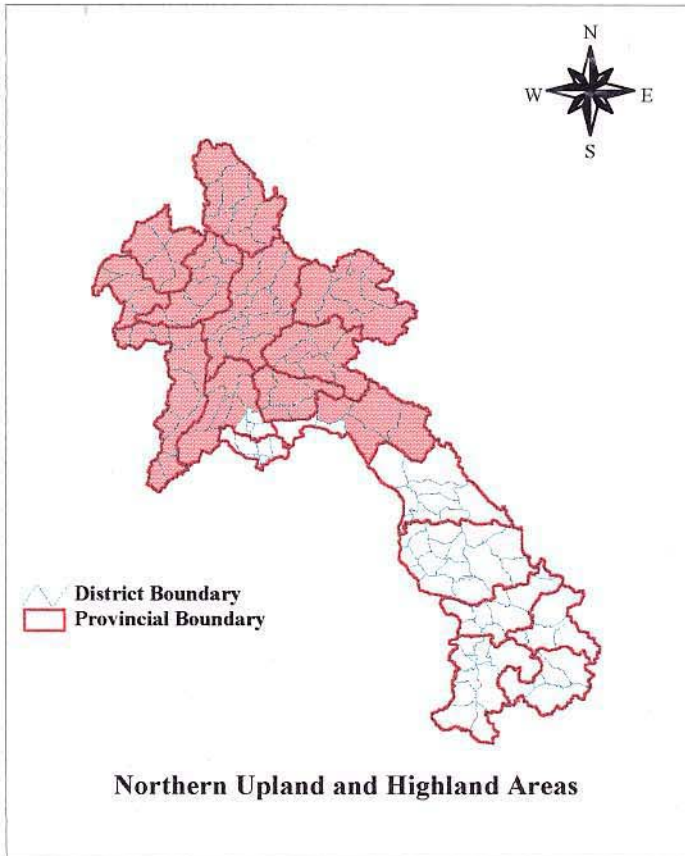
This area is classified as Group-10, and covers only one district of Pakxong in Champasak province (see Figure 4.1). This unique area produces several kinds of commodity crops of which coffee is the most famous. Much coffee is exported and brings considerable foreign exchange to Lao PDR. However, such earnings have declined of late due to the recent low prices on the international market.

The constraints identified in the PC Analysis are the comparatively low degree of diversification and water resource utilization for agricultural production. The basic direction for development is thus the removal of these constraints. The diversification of produce should be promoted together with productivity improvements to existing crops such as coffee, cardamom and tea. Production technologies are still low, and there is room for improvement. In addition, inadequate post-harvest techniques cause lower quality and lower prices. For diversification, the promising fields in this area would be vegetables, fruit, and livestock. For their promotion, all agricultural supporting services should be strengthened including research, extension, rural finance and the supply of market information.

The development of small-scale irrigation systems is expected to contribute largely to the stabilizing of agricultural production. Attention should be paid to economic feasibility and the degree of farmers' participation for construction, operation and maintenance.

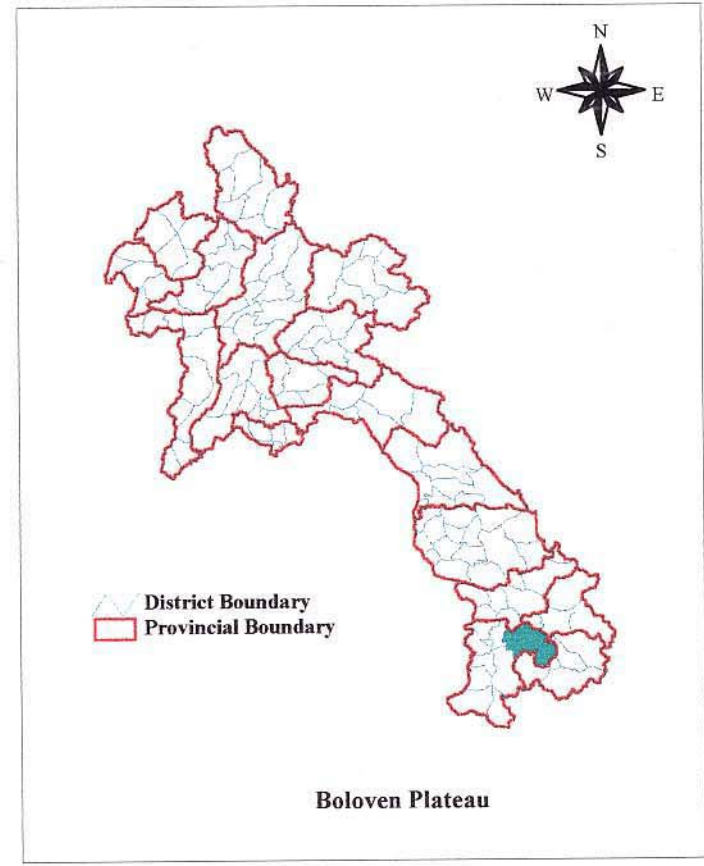
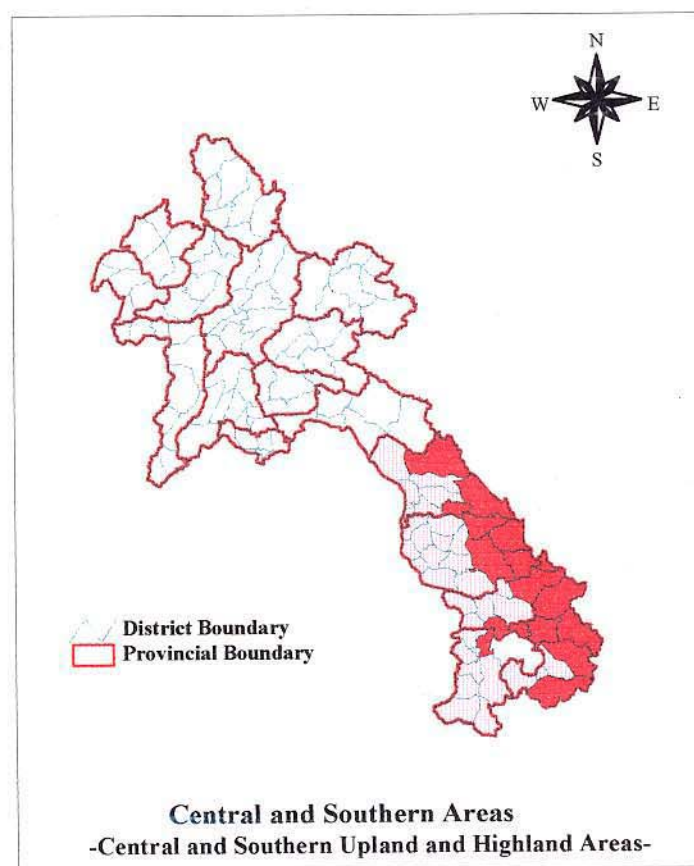
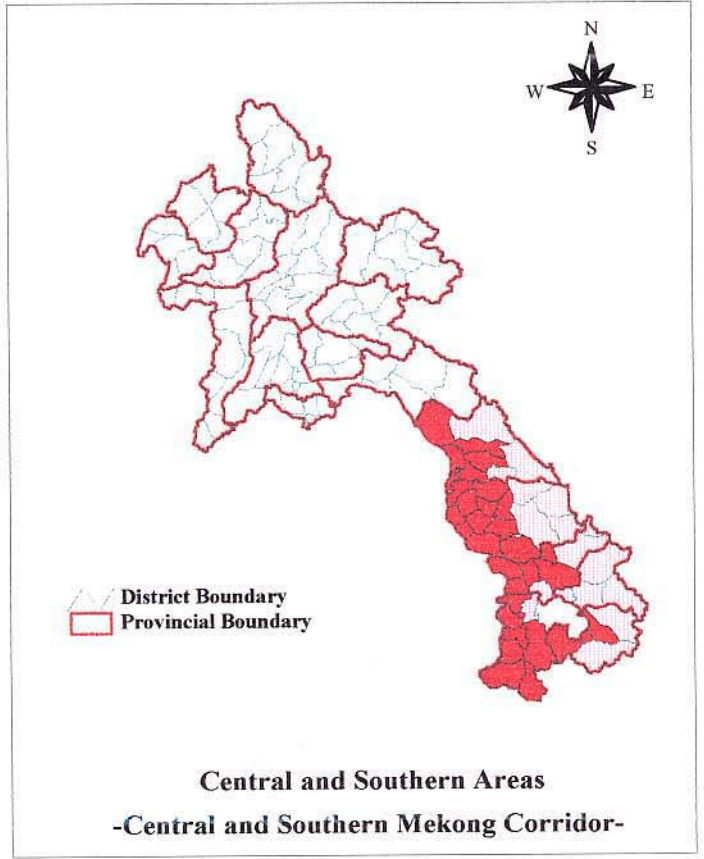
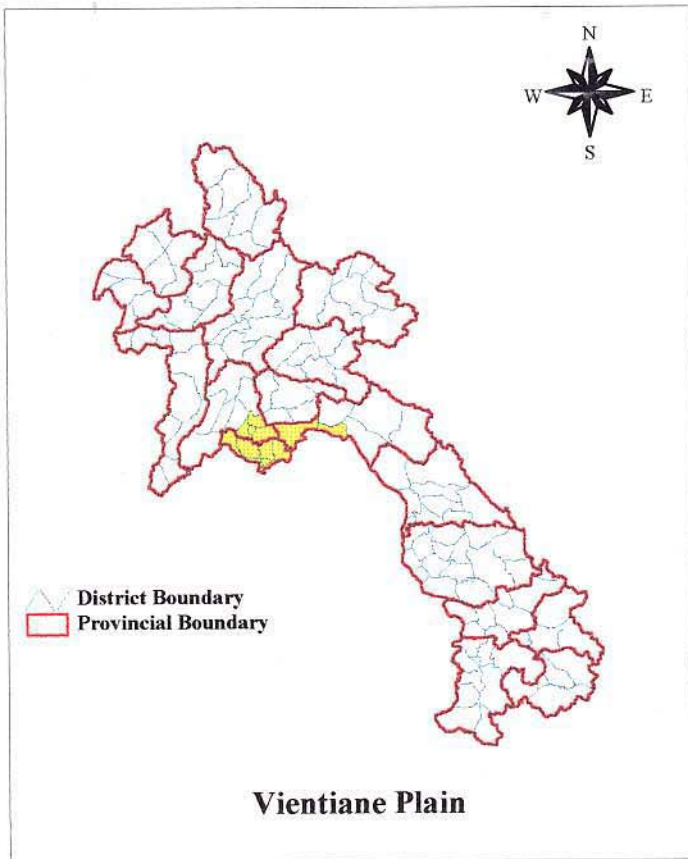


**Figure 5.1 (1/3) Area Based Agricultural and Rural Development**



100 0 100 Kilometers

**Figure 5.1 (2/3) Area Based Agricultural and Rural Development**



**Figure 5.1 (3/3) Area Based Agricultural and Rural Development**



## **CHAPTER 6 OBJECTIVE AND STRATEGY FOR SUB-SECTOR BASED AGRICULTURAL DEVELOPMENT**

### **6.1 Introduction**

The agricultural development plan is discussed on a sub-sector basis in this chapter. This is principally based on the results of assessments on present agricultural setting, agricultural potential and area-based agricultural development direction, and also through dialogues with the MAF and other governmental agencies concerned. The development plans is consistent with the Vision 2020 and the Strategic Vision. The development plans are formulated for every ten sub-sectors including; (i) land and water resources development, (ii) institutions and organizations, (iii) human resource development, (iv) field crops, (v) livestock and fisheries, (vi) stabilization of shifting cultivation, (vii) marketing and agro-processing, (viii) rural finance, (ix) rural development, and (x) irrigation. The discussions are made to the development objectives, development strategy, implementation process and expected results by the development for the respective sub-sectors.

### **6.2 Land and Water Resource Development**

#### **(1) Development Objectives**

The major objective of land and water resource development is to properly manage both renewable and non-renewable natural resources to help meet government goals, especially in the agricultural sector. The forests are a source of many timber and non-timber forest products, necessary to rural communities for subsistence and income generation, and are important cattle grazing areas. The rivers of Lao PDR contribute about 35% of the water to the lower Mekong river system, and the protection of these watersheds is of regional as well as national importance, particularly for lowland agriculture and fishing. Over the past 20 years, about half a million hectares of forests have been cleared and some wetlands drained for agricultural expansion. Some of this land was unsuitable for agriculture or should have been maintained in its original state. Thus, considerable pressure is being placed on natural resources and forest land to meet the increasing needs of an expanding population and in order to satisfy the government's policy of improving living standards.

Emphasis will be placed on ensuring: proper land use planning and sufficient land allocation for all rural people; providing information about agro-zone classification and current land use; protecting catchment areas to reduce erosion and ensure a more even flow of water; and improving weather forecasting to assist farmers and to help with flood mitigation.

The critical factors to achieve these objectives are properly trained and equipped people with sufficient transport means and funds to undertake land use planning, mapping, watershed development and gathering/interpretation of meteo-hydrological data. In the short term, emphasis will be placed on training, assessing existing land allocation, prioritizing the 64 water catchments and building or upgrading meteo-hydrology stations. Once this is done, then more effective land use planning and land allocation can occur along with land-use and agro-zone classification maps, watershed projects can be implemented and improved weather forecasting can take place.

## (2) Development Strategy

The strategy has been divided into four sections dealing with (a) Land Use, (b) Water, (c) Research (d) Environmental Initiatives. Within these sections there are 8 proposed programs/projects, but several of them are related to other sub-sectors especially shifting cultivation, crops, livestock & fisheries, human resource development and institutions & organizations.

### (a) Land Use.

The strategy is to: protect watershed and riverbank; implement appropriate land-use, paying attention to land capability including soil, slope and other bio-physical criteria; and realize environmentally friendly use of arable and pasture/forest land in uplands/midlands, plateaux and flatlands both rain-fed and irrigated. All too often, agricultural development has been at the expense of natural resources rather than using them to assist the farming systems to their mutual benefit. Much has already been said about shifting cultivation and its adverse effect on the land and upland people, but this is just one of many examples of poor agricultural practices. Arable farmers frequently crop right up to river banks. In consequence, gallery forests and grassy river banks have been destroyed, with disastrous results at times. Bank erosion is common and fields and topsoil have been lost. Again, cropping occurs on unsuitable soils and on land prone to erosion. If this happens in upland areas, it can lead to flash flooding, a shortage of water in the dry season and considerable erosion. This can and does adversely affect lowland farming. Establishing irrigation systems on unsuitable soil types can lead to salinization and/or over-use of water. Thus, land may become sterile and lost to agriculture at a considerable cost.

Based on the present conditions, it is proposed to implement “Strengthening Land Use Planning (LUP) & Land Allocation (LA) and Land Titling (LT)”. Part of this initiative, namely LUP & LA is an on-going activity within the

Department of Forestry and this should be followed by Land Registration and Titling. In many LUP & LA ‘completed’ villages there has been unsatisfactory and/or incomplete land allocation and the exercise may have to be reviewed. This is due to insufficiently trained staff, inadequate local participation and insufficient funds to complete the field work. Thus, where allocation has already occurred there is need for monitoring and perhaps revision. Also, assistance should be given to the remaining villages where allocation is still to be done. The Lao-Swedish Forestry Programme has developed LUP & LA methodology and has field-tested them. This activity should continue and be strengthened.

There is a good deal of suspicion among farmers about land allocation and many are reluctant to claim all the land that they farm, because of the tax burden and the poor quality of some land. This could be one of the reasons why there is a considerable difference between the agricultural statistics and the satellite imagery interpretation of cropped land, especially in uplands. Hence part of the reason for the next proposal.

Also, in order to achieve sustainable land use, “Agro-zone Classification, Land Management and Farming Systems Development” is proposed. This is an on-going activity within NAFRI, but shortages of funds and some skills are inhibiting this work. It is important for planning purposes to obtain an accurate picture of current land use and changes over time and to designate land according to its appropriate agricultural or other uses. Land use maps exist for 1982 and 1989, but only partial information is available for 2000/2001. A full country coverage should be undertaken quickly so that potential agricultural areas can be identified and verified on the ground. This should also assist with land-use planning. Satellite imagery and aerial photography could assist in this work.

(b) Water.

Donors are already supporting “Watershed Management Projects” in three catchment areas, namely Nam Neun, Nam Leuk and Nam Theun and there are several related projects affecting watershed management. Successful prosecution of this initiative will greatly assist in other areas, namely Shared Water Resources Management, Flood Disaster Mitigation and all the Shifting Cultivation Proposals as well as many lowland agricultural initiatives. There are about 5 million hectares of upper watersheds, many within NBCAs. Shifting cultivation is practised in some of these areas and in many instances it is leading to soil erosion and flash flooding. This in turn is adversely affecting down-

stream agriculture and contributing to flooding in lowland paddy areas. Excessive erosion could also affect the lifetime of dams especially small ones used for irrigation and micro-hydro schemes. In shifting cultivation areas, watershed management is part of the stabilization initiative and therefore, covered under Shifting Cultivation. However, there are catchment areas outside NBCAs where shifting cultivation is occurring. In many instances, these areas are identified on the map, but little, if any, action is taken on the ground for their protection and management. It may be a wasted effort to spend considerable funds rehabilitating irrigation systems or building new ones if the watersheds feeding these lowland systems are not properly protected. Therefore, it is essential that these catchments are properly managed so as to reduce erosion and flash flooding. Investments in such protective measures will give high returns to lowland agriculture as well as protecting downstream countries in the lower Mekong river system.

Middle and lowlands are also considered under this program and plans will be compiled for each river basin. Especially important is the soil and water testing part of this proposal. Little is done to advise farmers about the type of soil they have and ways to improve it. Many soils are acidic and a good deal have aluminium toxicity. Others have a poor humus base and yet other are prone to erosion. Thus, soil testing should be an essential part of the extension service. Applying the correct kind and quantity of minerals to the land, such as limestone dolomite or gypsum can improve crop productivity significantly. Again testing water can be important for lowland farmers using irrigation systems. Certain waters may be toxic or saline. These could be treated or the crop adjusted.

The other proposed project is “Shared Water Resources Management”. This project is to devise a water use and distribution plan for agriculture, power, industry and urban areas. It will have to be planned by water catchment area, especially for the agricultural and power sectors, although industry and urban areas could rely on groundwater to a certain extent. Therefore, if catchment areas are not properly protected the available quantity and quality may have considerable seasonal and yearly variations. This may have adverse effects, especially on the agriculture and hydropower sectors. This is why considerable emphasis and urgency has been placed on watershed management.

#### (c) Research

It is needed on all land formations from upland farming to dry-season irrigated agriculture and for annual, perennial and vegetable crops under rainfed and

irrigation conditions with acid, neutral and alkali soils. “Thus, Soil and Water Conservation Technology Program” is proposed to develop and refine appropriate technologies for soil and water management. This applied research program will supply hands-on information to subject matter specialists and extension workers on all land use types, but in particular for sloping lands. To complement the above program, “Irrigation Management Research Program” is also proposed. This initiative will enlarge research activities for irrigation water management. At present some technologies are rudimentary and lead to excessive water use, which can decrease the command area and bring salt to the surface in some instances, thus sterilizing the land. Techniques have to be adjusted to use irrigation water far more efficiently. “Rehabilitation and Expansion of Meteo-hydrology Stations for Agricultural Development and Flood Control” deals with rehabilitating and upgrading meteo-hydrology stations, which in many instances are dilapidated with poor or unworkable equipment. Farmers require timely and accurate information on weather and river conditions in order to help them in their activities.

(d) Environmental Initiatives

STEA needs assistance to: support community based land management associations; improve agricultural related environmental data collection; assist in the formulation and execution of environmental regulations related to agriculture, forestry, fisheries; and assist in the formulation and execution of environmental regulations related to agro-processing, agro-related industries and cottage industries. Thus, “Support to the Science, Technology and Environmental Agency to foster Environmentally Friendly Agricultural Development (EFD)” is proposed. Ensuring environmentally friendly farming and other rural activities is just as important as monitoring urban and industrial activities. If not monitored correctly some agriculture activities and practices can and do lead to adverse environmental consequences, which can affect not only the immediate area but also have far reaching impacts of a regional and even a global nature.

Each line ministry is supposed to produce environmental assessment regulations by March 2002 and they should have submitted to STEA a list of all ongoing projects by September of 2000. MAF has not complied with the latter directive and it needs assistance with the former. This is why such a project is important to MAF. Some of the proposed initiatives in the M/P study will require an initial environmental examination (IEE) and all will require an environmental screening in order obtain an Environmental Certificate of Compliance. MAF

and/or Donors will be the developers of many of the proposed projects and therefore, they will have to undertake an Environmental Screening and an IEE if required. STEA could assist MAF in this if it had the necessary personnel etc.

### (3) Implementation Process

Of the above eight proposed projects, four are proposed as the short-term strategy and the other four projects will be positioned in mid to long term.

As the short term strategy, the ongoing activities should be strengthened by keeping on the efforts to date. The following four projects fall into this category.

- Land Use Planning & Allocation, Land Titling.
- Agro-zone Classification, Land Management & FSD.
- Watershed Management.
- Rehabilitation and Expansion of Meteo-hydrology Stations for Agricultural Development and Flood Control.

These four projects are essential to support other agricultural activities proposed during the same time period. The four projects proposed in the long term are:

- Shared Water Resources Management.
- Soil and Water Conservation Technology Research Program.
- Irrigation Management Research Program.
- Environmentally Friendly Agricultural Development.

These latter proposals are also important, but it is felt that there are insufficient trained personnel to undertake all the proposed projects within the first 10 years.

### (4) Expected Results

In short and medium term, the outcomes are expected as follows.

- Agreed village and individual boundaries; land use planning according to land suitability at village level; land allocation according to needs and government regulations; land allocation as a necessary step for registration and titling and as a necessary step towards improving productivity and stabilizing shifting cultivation; and community plans made for forests will be realized.
- Agro-zone classification maps and land use statistics by district, province, region and country will be provided. This will greatly assist land use planning, land management and farming systems development. Maps will be produced and up-dated on existing land use. Changes can be tracked over time and land-use areas by district, province and country can be compared and contrasted to other statistics such as the agricultural census figures.

- Shifting cultivation stabilization and better management on upland and lowland farms, a more even (and year-round) flow of rivers, flood mitigation and a decrease in soil erosion will be strengthened. Finally the outcomes of the Rehabilitation and Expansion of Meteo-hydrology Stations will be better intelligence for controlling flooding, managing water and improving farm management.
- In the longer term, the outcomes for the four initiatives proposed are better and sustained water allocation (Shared Water Resources) improved and environmentally acceptable land use (Support to STEA) and soil and water conservation (Soil and Water Conservation Technology), better and sustainable use of irrigation water (Irrigation Water Management Research).

### **6.3 Institution and Organization**

#### (1) Development objective

Extension services for farmers are relatively poor because of lack of mobility and funds. All Commercial activities such as vaccinations and fingerling production, etc. would be more efficiently undertaken by the private sector. The role of government should be to give supporting services to farmers and consumers at the least cost. The people should be the main actors in the market economy. It is also noted that government should concentrate its activities in supplying essential support services to areas that are not financially attractive to the private sector.

The Government's role for agriculture in the market economy should be to give supporting services, at least cost, to the private sector such as farmers and consumers, who should be the main players in the market economy. Therefore, the development objective of institutional and organizational improvement is: i) to establish a favorable environment for the operation of the market mechanism in the agriculture sector; ii) to restructure MAF and its line agencies at provincial and district level for an innovative and efficient administrative organization.

#### (2) Development strategy

The following is the development strategy in terms of institutional and organizational improvement.

##### (a) Strengthening management and operation capability of MAF

The actual management and operation capacity of MAF is weak and needs additional support in terms of institutional strengthening and human resource development. MAF will be further strengthened and help transform the Ministry from a command and control organization to a facilitating organization for boosting agriculture and forestry development within the evolving market

economy. To accomplish this major objective, the capacity of the Ministry will be strengthened with regard to management, planning, research coordination, aid coordination and implementation, and to support agricultural extension to respond to farmers diversified needs. The major institutional development of this program will be the strengthening administrative and management procedures, planning and statistical capacity, human resource development management within the departments and agencies at the central, provincial and district levels. In relation to human resource development and agricultural extension, there will be a need to organize and develop a National Agriculture and Forestry Extension Agency (NAFEA) under the mandate and institutional framework of the Ministry. The establishment and development of such an organization is further elaborated in section 7.3. The following will be included in this program.

- Strengthening the administrative and operational management of MAF, and establishment of improved administration and management procedures for MAF's departments and agencies.
- Strengthening the planning and statistical capacity of MAF by developing a bottom-up planning and management information system from DAFO to MAF, and by introducing new technology for statistical collection data.
- Strengthening human resource development management of MAF, by developing a human resource development center for planning and coordinating human resource development activities, by improving personnel data base, by elaborating job description for all function and by developing career development plans.

(b) Strengthening operational management and planning capacity of PAFS and DAFO

In term of human resource and institutional development, the conditions of PAFS and DAFO are more critical. It is essential to solve the uneven distribution of staff by staff reallocation in both PAFS and DAFO. This will be achieved if there is an adequate budget arrangement for operational expenses of these organizations.

At the provincial and district levels, the program will extend MAF's institutional development activities to the provinces. It is important that the procedures and system developed by MAF are workable and tested at the PAFS and DAFO levels. In relation to the decentralization policy, there is a significant need to strengthen the budgeting and financial management capacity of PAFS and DAFO as well as their capacity for the planning and management of



development projects as most future projects will be implemented under these organization. The program will include similar institutional development as follows.

- Strengthening administration and operational management of PAFS and DAFO, with a focus on financial management and project management.
- Strengthening planning and statistical capacity of PAFS and DAFO by developing and field testing the bottom-up planning and management information system developed by MAF.
- Strengthening human resource development management of PAFS and DAFO.

(c) Strengthening NAFRI

NAFRI was established as an agriculture and forest research institute in 2000 through the integration of concerned research centers under each department. The research outputs of NAFRI are very important to accelerate the market economy in the agriculture sector. NAFRI has various problems in terms of human resources, coordination amongst research centers and research facilities, since NAFRI was established recently. It is, therefore, important to implement: i) strengthening coordination and communication systems between research centers and installation of an information technology (IT) system; ii) strengthening research capability; iii) improving the research environment; and iv) strengthening research coordination with other countries.

(d) Setting up regulations relating to agriculture and strengthening the inspection system

A regulation and inspection system should be developed if an appropriate system relating to agriculture is not already established. The following is required in this area. However, the inspection system should be as simple as possible to avoid making barriers to private business expansion.

- Regulation and inspection system relating to plant protection.
- Regulation and inspection system relating to agro-chemicals insecticides and pesticide.
- Inspection or certification system for new varieties of seeds and cuttings, etc.

(e) In the medium to long term, there should be: i) the issuing of necessary decrees or revision of controls to guarantee free business operation, including crop, animal, forestry and fishery industries; and ii) re-orientation

of staff from government services in relation to the market economy demands.

### (3) Implementation process

The implementation of the above development strategy will be done step by step. Priority will be given to institutional development and strengthening of MAF and to the strengthening of NAFRI, which are considered as the fundamental issues for developing and implementing other agriculture and forestry projects.

In the medium term, the implementation would focus on setting up regulations relating to agriculture and strengthening inspection systems. However, regulation and inspection systems relating to plant protection should commence earlier, as it is an essential pre-condition for the export of agriculture products.

In relation to the large number of organizations and staff involved, the strengthening program of PAFS and DAFO would be viewed as medium to long-term in the implementation strategy. However, under the institutional development and strengthening of MAF, pilot schemes will be introduced in priority provinces and districts in order to accelerate the decentralization process.

### (4) Expected results

The program for Institutional Development and Strengthening should increase the organizational and operational planning capacity of MAF and its related agencies. The output will be in form of:

- Institutional strengthening of MAF's Cabinet, DOP and Department of Personnel.
- Institutional strengthening of the Administration Division of all Technical Departments.
- Institutional strengthening of PAFS and its Administration Section.
- Institutional strengthening of DAFO and its Administration Unit.
- Established in-service training program for Department staff, PAFS staff and DAFO staff.
- About 20 Master trainers in the field of Organization and Planning.
- About 160 department staff trained and mobilized.
- About 145 PAFS staff trained and mobilized.
- About 846 DAFO staff trained and mobilized.

The NAFRI Strengthening Program should provide; i) enhanced research efficiency; ii) improved research quality; and iii) technical and administrative improvement for the 360 NAFRI staff.

Through improvement to the inspection systems under appropriate regulations, the following results will be expected.

- Agricultural export market will be expanded through enhanced confidence of agricultural importers.
- Crops will be protected from insects or disease originated in other countries.
- Farmers will be able to access appropriate farm inputs in terms of quality, quantity and security.

#### **6.4 Human Resource Development**

##### **(1) Development objectives**

The long-term human resource development objectives are:

- To provide MAF and local line agencies with qualified administrative and professional staff.
- To provide qualified support service to farmer communities and enterprises in the development of sustainable agriculture under the evolving market economy.

To achieve the above long-term objectives, the immediate objectives are:

- To restructure and strengthen the administration, management and planning capacity of MAF departments and agencies, and provincial and districts agriculture and forestry services in relation to decentralization and market economy policies (referring to Section 6.2).
- To strengthen agricultural and forestry extension services through the institutional strengthening of agricultural and forestry organization at district, provincial and central level.
- To develop formal training and education in irrigation of existing and future SMS and irrigation engineers, agriculture engineers, forestry engineers and superior technicians.
- To enhance awareness of rural school children in the conservation of nature and the environment as well as sustainable agricultural practice.

The critical factors influencing the achievement of the above objectives to be considered and action to be taken are:

- To revise the PIP and increase the budget allocation for implementing the extension activities, especially at the field level, in order to meet the objectives.
- To forge a consensus among agencies in the implementation of the decentralization policy and program of MAF.
- To re-allocate staff to improve the imbalance of staff between the center and local levels.

(2) Development strategy

The following is the development strategy for human resource development.

(a) Strengthening agricultural and forestry extension services

At the central level, a National Agriculture and Forestry Extension Agency<sup>1/</sup> (NAFEA) would be established to coordinate, plan and implement all agricultural extension activities within the mandate of MAF. A Central Extension Training Unit (CETU) attached to NAFEA would be established. The CETU would coordinate the implementation of agricultural and forestry activities in all provinces, drawing upon experts and resource persons available in the various departments of MAF. The CETU would be responsible for preparing training and extension plans in collaboration with PAFS and Regional Agriculture and Forestry Extension Training Centers (RAFETC).

At the provincial level, a Provincial Extension Training Unit (PETU) would be established within PAFS. It would be comprised of staff assigned from various existing sectors (crops, livestock/fisheries, forestry and irrigation). The role of the PETU would be to coordinate the extension programs of the districts within the province and to organize the training of the district staff. The PETU staff would receive training on extension from the CETU and RAFETC and would be responsible for training staff of DAFO.

At district level, a training program to upgrade the technical knowledge and extension skills of DAFO technical staff would be developed. The training program would target district staff to enable them to become effective multidisciplinary Farming System Extension Workers (FSEW). In coordination with the RAFETC project, the FSEW would be trained in the mix of technical skills needed to support the farming systems in each area.

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<sup>1/</sup> MAF Ministerial Decision No. 0306/KP.CT.2000 dated 4/4/2001 for the establishment of the National Agriculture and Forestry Extension Agency.

(b) Developing district in-service training and farmer training in agriculture and forestry.

Agricultural extension would be developed under MAF's national program with the establishment of NAFEA and its related agencies at provincial and district levels. In each district a District Extension Unit (DEU) with district extension agents would be established and assigned. District extension agents would be trained in two basic areas: implementation of village development and planning; and technical training as farming system generalists. This will enforce the concept of the farm as a total system, rather than the farm as an unrelated series of production activities. The Village Development Planning Training Program of the RAFETC would establish the basis for developing the extension methodology for strengthening the agricultural and forestry extension services.

Training of farmers will be one of the main activities of the RAFETC. Short training courses for farmers would be tailored according to the needs in each locality. However, a regular farm management course that includes basic knowledge in crops and livestock production would be established. Special courses for farmers would also be established and cover different topics (rice, crops, cattle-ruminant, poultry, fishery, agro-forestry, management of non-timber forest products, agro-processing, marketing, etc.) and the needs of different localities.

One strategy for the development of extension service capacity would be to develop a financially self-sustaining market oriented extension system. Therefore, the concept of the RAFETC-Farmers Vocational School (FVS) would be to develop self-financed centers, which would generate their income through training fees and services.

A staged approach will be adopted for the development and implementation of the activities specified above. The development scenario would be to develop three RAFETCs and six FVSs following six geo-ecological regions in the first and second phase and to develop one FVS for each province in the later stage. Phase 1 of the project will be to develop and strengthen three RAFETCs and three FVS in Louangprabang (Xieng Nguen AFETC), Vientiane Province (Hinheup-Pakcheng VARDP) and Savannakhet (Xepon AFETC). Phase 2 will expand the FVS concept into three other regions by developing and strengthening three FVSs in Louangnamtha (Namtha-Muong Sing), Houaphan (Muong Hiem) and Champassak (Paksong). Phase 3 will be

to develop Provincial Farmers Vocational Schools in the 11 remaining provinces.

(c) Strengthening the capacity of technical education in agriculture and forestry

The proposed program will enhance the restructuring of the technician schools academic program and improve the school facilities in order to develop agriculture and forestry technical education under the agriculture sector vision. The major component of the project will be to develop a uniform curriculum for the four technician schools (Pakxoueng-Louangphabang, Muong Mai – Borikhamxai, Nakae – Savannakhet and Pakse – Champasak) that will cover 4 major subjects such as crops, livestock/fisheries/ veterinary, forestry and irrigation. The development of the new curriculum will be followed by: the development of lecture notes and text books for new major subjects; the development of botany laboratory, veterinary laboratory, soil laboratory, and other laboratories specified in the curricula and syllabi; and the development of tools, equipment and teaching aids. The development of school farms will be one feature for the new practical and market oriented curriculum. The development of school farms will include the construction of training facilities, irrigation systems, livestock pastoral areas, fish culture, agro-forestry, fruit tree orchards, pig farms, poultry farms etc. depending on the location. The farms will also serve as schools for farmers.

A teacher/trainer upgrading program will be initiated in order to upgrade the teaching capacity and the educational level of the teachers and trainers required under the new curriculum. The program will include overseas training scholarships for teachers/trainers and long term and short term training at NUOL and On the Job Training at the schools.

A staged approach is proposed for the implementation of the program. The development of uniform curriculum and the teacher up-grading program will start first and will be followed by the improvement of the Pakxoueng AFTS and Pakse AFTS. After the completion of the teacher upgrading program the improvement of Muong Mai and Nakae AFTS would commence.

(d) Improving the Irrigation Technician School

Since 1996, the Government of Lao PDR has implemented irrigation priority programs. Those have almost doubled the country's irrigated areas from 156,000 ha in 1996 to 295,000 ha in 2000. Irrigation technicians are also required in the private sector for construction and mechanical installation and operation activities and in the communal sector (water users' organization) for water management, irrigation system operation and maintenance, and mechanical operation and maintenance. By considering the need to educate and train more irrigation technicians, MAF decided to establish the Tha Ngone Irrigation Training Center under the Department of Irrigation. The training center was later turned into an Irrigation Technician School in 1999.

The proposed program will develop the school's academic program and improve the school facilities of Tha Ngone Irrigation Training Center in order to develop irrigation technical education under the agriculture sector vision. The major component of the project will be to develop a comprehensive curriculum for the school. This will be followed by: the development of lecture notes and text books for the new major subjects; the development of laboratories specified in the curricula and syllabi; the development of tools, equipment and teaching aids; and the development of mechanical workshops and school farms. A teacher/trainer up-grading program will be initiated in order to upgrade the teaching capacity and the educational level of the teachers and trainers required under the new curriculum.

(e) Strengthening the capacity of university education in agriculture and forestry

The development of the Nabong Faculty of Agriculture Sub-project will be a continuation and follow-up of an on-going French supported project for strengthening the academic program and teaching capacity of the faculty. The development of the Dongdok Faculty of Forestry will be a follow up of a German funded project for promoting forestry education at the faculty. In Tadthong Department of Irrigation Engineering, the emphasis will be placed on developing curricula, pedagogic capacity and human resources. Due to the academic level and shortage of graduate staff, it is anticipated that a master degree in irrigation engineering would be established later.

In relation to the formation of SMS for MAF a Special Pre-Master program will be established for crop and livestock sciences at Nabong. This special

program will be made by cooperating and coordinating with relevant universities and institutions abroad. An up-grading program for Higher Technician to the B. Sc. Program will be established in order to up-grade the staff at MAF and PAFS.

(f) Developing agriculture and forestry education in primary and secondary schools

The people of Lao PDR have carried out agriculture capitalizing on favorable natural conditions. It is therefore important to sustain such favorable natural conditions and take special care of environmental sustainability. In this regard, the curriculum in environmental awareness and agriculture subjects at primary and secondary schools located at rural areas should be initiated in a later stage.

(3) Implementation process

The implementation of the above development strategy will be done step by step. Priority will be given to the development of the national integrated extension system and to the in-service training of district staff and farmers. In the medium to long term, the implementation would be to strengthen the capacity of agriculture and forestry education. However, the development of new curricula and syllabuses for the agriculture and forestry technician schools is a priority.

In relation to the large number of organizations and staff involved in the strategy for developing the national integrated extension a phased approach would be implemented to develop the extension system in the provinces and districts. It is recommended to implement the program in three phases with priority provinces and districts selected for each phase.

(4) Expected results

The expected results of the various programs for human resource development are:

- About 20 CETU trainers, 150 PETU SMS trainers and 1,000 FSEW trained and mobilized.
- About 1,000 FSEW trained under the FSEW Training Courses.
- About 2,000 DAFO Regulatory Staff trained under DAFO Regulatory Training Courses.
- About 8,000 Farmers trained under the Regular Farmer Training Program of AFETC-FVS.



- About 440 students per year will obtain a diploma of Agriculture and Forestry Technical Education accredited by MAF and the Ministry of Education.
- About 90 students per year will obtain a diploma of Irrigation Technician accredited by MAF and the Ministry of Education.

## **6.5 Field Crops**

### **(1) Development objectives**

For the development of the crop sub-sector, the development objectives are geared to the two distinct agricultural settings in Lao PDR. One is for flatland and the other is for sloping areas, based on the Government's Strategic Vision for the Agriculture Sector.

#### Flatland Area

- To maintain or accelerate the pace of market-driven changes in the agriculture sector of the Mekong corridor through: (i) introduction and expansion of crop diversification including cash crops; (ii) introduction and expansion of intensive farming with livestock and inland fishery; and (iii) enhancement of crop yields.
- To ensure food security to meet the demand of increasing national population as well as increasing urban population caused by migration from rural areas. This has to be performed mainly through the improvement of unit yield of paddy and the expansion of the dry season paddy area.
- To improve crop husbandry for enhancing and stabilizing farm income by providing adaptive research result, demonstration on farmers' fields, reliable market information through appropriate extension systems and training.

#### Sloping Land

- To accelerate the integration of sloping area into market economy through: (i) improvement of farm to market roads; (ii) acceleration of participatory land allocation; (iii) implementation of farmer demand driven extension including adaptive research, trials and demonstrations on farmers' fields; (iv) introduction and expansion of rural finance; and (v) market information delivery.
- To diversify income source and enhance farm income through: (i) farming diversification; (ii) agro-forestry development; (iii) introduction and expansion of non-timber forest products (NTFP); and (iv) introduction and expansion of combining farming with livestock and inland fishery.
- To promote environmentally sound and sustainable use of natural resources through: (i) implementation of participatory and sustainable land use management; (ii) stabilizing shifting cultivation; (iii) stabilizing upland rice cultivation area; and (iv) introduction of communal management of natural resources.

## (2) Development strategy

Based on the above development objectives, the development strategy for agricultural crop development is established for each development field, i.e. food security in flatland, commercial agriculture in flatland, crops in sloping areas and others. The strategy of each field is described below:

### (a) Flatland

#### 1) Food Security (Paddy/Rice)

For ensuring food security, the following strategies are applied to the flatland.

- There would be little need for the development of new paddy fields (including irrigated paddy field) particularly over the next 10 years. The increase of paddy/rice consumption, which is coupled to population growth, could be met by increased unit yield. Measures to be taken for increasing unit yield include: i) identification and distribution of improved varieties of rice seed suitable for the area specific conditions; ii) strengthening extension services to improve farmers' cultivation and water management technology; and iii) supply of more credit for purchasing farm inputs.
- On the other hand, expansion of dry season paddy area is expected at a total of 10% in each of the periods 2000-2010 and 2011-2020. The present size of dry season paddy area (about 91,800 ha) would therefore increase by about 20% to 112,000 ha in 2020. This is still smaller than the present dry season irrigable area (about 197,000 ha) which is under existing irrigation facilities. It is, therefore, judged that sufficient irrigable area for dry season paddy is available and its expansion should be promoted through rehabilitation of existing irrigation systems and introduction of proper irrigation water management.
- For ensuring food security from the above viewpoints, DOA should implement "Rice Seed Multiplication Systems Improvement" and NAFRI should implement "National Rice Research Program". Other measures that should be taken into consideration regarding food security by other sub-sectors are described in the respective sub-sections, i.e. organization and institution, human resource development, irrigation, rural finance.

#### 2) Commercial agriculture

For accelerating commercial agriculture in flatlands, the following strategies are applicable.

- Most farmers show a higher concern for food security rather than the introduction of new crops in flat lowland areas. As a practical matter, the new generation of farmers who require land for their food production would expand the paddy area. Moreover, farmers have limited experience on the cultivation of crops other than paddy and accordingly, are risk averse. In such cases, over production of rice could

occur. In order to avoid such a situation as well as enhance farm income, crop diversification should be promoted particularly in the flat paddy areas.

- As mention in the above food security paragraph, the difference between paddy area and total irrigation area in the dry season is still 105,000 ha at present and is projected to be 95,000 ha in 2010 and 85,000 ha in 2020, if new irrigation development is not made. The areas not used for paddy should be utilized as possible area for diversification. Therefore, the target area of crop diversification is around 80,000 ha. The potential crops are fruit, vegetables and industrial crops are proposed in Sub-section 3.2.5.
- Previous research work on horticulture and industrial crops is very limited with the exception of that for coffee. Therefore, research outputs from the trials of new crops/varieties and the development of applicable technology on crop diversification are in rather short supply. For realizing crop diversification, the development of adaptive technology is essential and urgently needed, and NAFRI should carry out various research programs. Potential crops for diversification are mentioned in Section 4.1.5. The proposed programs include “Coffee Cultivation Technology Research Program”, “Vegetable Cultivation Technology Research Program”, “Fruit Cultivation Technology Research Program”, and “Upland Crop Cultivation Technology Research Program”.
- In parallel with technology development to be carried out by NAFRI, manageable and small demonstration plots using trial species and/or adaptive technology on crop diversification should be established under the full management or guidance of government extension staff. Of course, trial species and/or adaptive technology developed by NAFRI or by other neighboring countries should be applied. The farmers could then see at first hand the technical possibilities and financial attractiveness of diversification. As a result, farmers will gradually lose their risk aversion through observation of demonstration plots. Accordingly, some farmers will start crop diversification practice on the basis of visual knowledge in from demonstration plots. To enhance their technical level, it is recommended that these demonstration plots could be used for training local extension staff and farmers on the basis of “Teach by Showing” or “Learning by Doing”.
- The establishment of demonstration plots and training is the most important component of commercial crop promotion projects. DEA, PAFS and DAFO will implement the commercial crop production projects including “Pilot Integrated Agriculture Promotion Project in Plateau Area”, “Crop Diversification Program”, “Outer City Horticulture Promotion Program”, “Sustainable Sugarcane Production Promotion Program”, “Export Oriented Crop Promotion Program” and “Fruits Crop Promotion Program”. In addition, sericulture is also promoted as “Sericulture Development”, and “Private Sector Assisting Project for Silk Production (Large Scale)”, since most raw materials for the handloom industry are imported.

- It is also reported that there are shortages of improved seeds and planting materials for promoting crop diversification. This is caused by the absence of private seed companies and the high price of imported seeds. To resolve this seed constraint, the Government may need to take responsibility for developing and supplying foundation seeds for some crops. Private seed farms should implement multiplication of these foundation seeds to minimize government interference in the market economy. In this connection, DOA and NAFRI will implement the project on “Foundation Seed Technology Development”.
- The above crop diversification and combined agriculture with livestock and fishery need more manpower to properly maintain the field. In future, on the other hand, more large scale integrated agriculture will be introduced to enhance and stabilize farm income. In this situation, mechanized farming will be required in order to decrease production costs and increase work efficiency. To expand mechanized farming, NAFRI should implement “Mechanized Farming System Research Program” and “Agriculture Machinery Performance Test Criteria”. “Integrated Farming Technology Research Program” is also required to promote integrated agriculture on a larger scale.

(b) Sloping land

To encourage the market economy in sloping lands, the following strategies will be promoted.

- Most upland paddy production is carried out under shifting cultivation. To stop it spreading, increasing the unit yield of upland paddy and promoting other farm income activities are most important tasks in Lao PDR. To accomplish this, NAFRI should implement the “National Rice Research Program”. In general, the sloping areas import paddy from flat lowlands due to low upland rice productivity. Shortage of paddy may occur in upland area thus food security is a more important issue than in flatlands. Therefore, “Rice Storage for Emergency Purpose” is proposed for remote uplands.
- Stabilization of shifting cultivation cannot be achieved by only taking measures to increase unit yield of upland paddy. Other important measures include research and extension activities to convert shifting cultivation areas into permanent farmland. From this point of view, research work should be strengthened so as to identify cropping patterns and cultivation technologies that are applicable to the major shifting cultivation regions. The research work should be comprehensive, covering a wide range of products in addition to upland rice, e.g. other annual crops, tree crops (including fruit trees) and several kinds of livestock. Priority should be given to increasing farm income. For this, NAFRI should implement the “Integrated Upland Agricultural Research Project”.
- In addition to the above research work, strengthening the extension and credit services are needed to stabilize shifting cultivation in an

integrated manner. With the former service, dissemination of technologies that have already been developed by past research activities would have priority. The crop promotion program of various crops is also highly applicable to sloping areas, especially, upland crops, fruit, and sericulture.

- Although this is not critical from the national food security viewpoint, new irrigation area development in uplands would have a high priority for shifting cultivation stabilization. This would be promoted, but only after taking its economic feasibility into account. This will be mentioned in the irrigation development sub-sector.

### (c) Others

The extension system is a foundation for implementing crop programs as mentioned above. The institutional and human resource aspects related to extension service is described in Sections 6.2 and 6.3, respectively. The extension materials are also important and DOA has already prepared such extension materials. However, improvement is required, since adaptive research and demonstration results would be available after the implementation of various projects. Therefore, it is proposed that DOA and NAFRI should implement the “Farming Technology Dissemination Project” to enhance the efficiency of the extension service. After the implementation of various projects related to crops, the opportunities of contract farming with agro-processing factories or middlemen might be expanded. If so, “Contract Farming in Intensive Area” will be undertaken to expand market channels for commercial crops as well as to stabilize farm income.

### (3) Implementation process

In total, 23 projects are proposed for the crops sub-sector development. The implementation plan of the proposed projects, including a sequence of activities during 2001-2020 period, is formulated. The implementation plan is divided into three phases, short, medium and long terms.

As the short-term strategy, the existing systems of crop agriculture should be improved through continuation of on-going or past efforts. These are related to rice production including “Rice Seed Multiplication Systems Improvement”, “National Rice Research Program” and “Integrated Upland Agricultural Research Project”. Other than rice production, “Sericulture Development Project” and “Pilot Agriculture Promotion Project” are also considered as projects to expand past efforts.

The foundation approach to develop commercial agriculture in flatlands should also be commenced in this Phase. From this point of view, most research programs related to crop diversification are foundation requirements, since demonstration cannot be implemented without adaptive research results. Therefore, “Coffee Cultivation Technology Research Program”, “Vegetable Cultivation Technology Research Program”, “Fruit Cultivation Technology Research Program”, “Upland Crop Cultivation Technology Research Program” will be implemented in this Phase. In parallel with these research programs, institutional strengthening programs of NAFRI should be implemented to increase research efficiency and quality. It is also proposed that the project on “Foundation Seed Technology Development” will be implemented at initial stage, because eliminating the shortage of improved seeds is one of the key issues for promoting crop diversification, and it will take time for the to develop foundation seeds.

As the middle-term strategy, research results developed in the Phase I should be applied in the field as demonstrations for farmers. In this connection, various promotion programs should be implemented, namely: “Crop Diversification Program”, “Outer City Horticulture Promotion Program”, “Export Oriented Crop Promotion Program” and “Fruit Crop Promotion Program”. For implementation of the above projects/programs, a sound extension structure from the central to field levels is essential. It is also noted that irrigation water management and supply of more credit to purchase farm inputs are important. Therefore, the concerned projects should be commenced before year 2005 and various promotion programs will then follow commenced depending on their progress. To enhance the efficiency of extension services, “Farming Technology Dissemination Project” will be commenced in this Phase.

Most basic projects for food security and crop diversification will commence in the short and middle terms. The long-term strategy focuses on stabilizing food security and expanding advanced commercialized agriculture through mechanized farming and contract farming. “Private Sector Assisting Project for Silk Production (Large Scale)”, “Mechanized Farming System Research Program”, “Agriculture Machinery Performance Test Criteria”, “Integrated Farming Technology Research Program”, “Contract Farming in Intensive Areas” will be implemented in the long term strategy.

#### (4) Expected results

The following results are expected through agricultural crop development.

### Flatland Areas

- Rice seed multiplication system will be completed by the year 2010 and 100% of farmers will use improved rice seeds by the year 2020.
- Target on access to extension service and rural finance as well as enhancement of irrigation efficiency is cited in other sub-sectors.
- The following areas, yields and production targets for lowland and dry season paddy will be achieved by the year 2010 and 2020.

**Table 6.1 Target Area, Yield and Production of Lowland and Dry Season Paddy**

Item			Yr. 2000	Yr. 2010	Yr. 2020
Lowland paddy	Area	(ha)	475,500	475,500	475,500
	Yield	(ton/ha)	3.27	4.30	4.50
	Production	(ton)	1,552,800	2,046,655	2,139,750
Dry season paddy	Area	(ha)	91,800	101,800	111,980
	Yield	(ton/ha)	4.25	5.49	6.00
	Production	(ton)	390,150	559,256	671,880

- Cultivated area other than paddy in dry season will be 20% (40,000 ha) of irrigation area in year 2010 and 40% (80,000 ha) in year 2020.
- More than 70% of total coffee production will be of an internationally acceptable quality in year 2010,
- 100% of farmers, with access to the sericulture training center, will use improved varieties of silkworm, receive technical training and use improved cottage basin in 2020.

### Sloping Land

- Improved seeds and adaptive research result will be developed for upland rice.
- Target on access to extension service, rural finance and market are explained in other sub-sectors.
- The following areas, yields and production of upland paddy will be achieved by the years 2010 and 2020.

**Table 6.2 Target Area, Yield and Production of Upland Paddy**

Item			Yr. 2000	Yr. 2010	Yr. 2020
Upland paddy	Area	(ha)	152,100	110,000	110,000
	Yield	(ton/ha)	1.70	1.70	2.00
	Production	(ton)	258,750	187,000	220,000

- Income source will be expanded through farming diversification including fruit, vegetable and upland crop production.
- Other income sources including NTFP and agro-forestry on sloping land will be explained in the sub-sector of “Stabilization of Shifting Cultivation”.

## 6.6 Livestock and Fisheries

### 6.6.1 Livestock

#### (1) Objectives of Livestock Development

Livestock, not only plays a major role in farming systems for animal power and organic fertilizers sources, but also is one of the most competitive commodity productions in diversified agriculture both in the flat and sloping lands. There is a large potential to increase livestock production through improved animal health, animal nutrition and livestock breeding. About 90% of the present animals are raised by small-holders. They are not full time livestock farmers and their livestock productivity is low under the present feeding system. However, livestock are an important income source. On the other hand, there are many unused natural pasture land where large scale livestock developments with low investment is possible by introducing modernized management technology for feed production and storage.

With these favorable conditions, livestock development is expected to have wide range objectives; increased farmers' income, supply of animal protein to urban residents, enhancement of the national economy through increased export of livestock and high-value added processed goods. In addition, livestock will exploit unused land resources as grazing fields for their more effective use. Major animals for livestock expansion are yellow cattle, buffalo, pigs and poultry. Livestock production will be increased both by strengthening small-holder farmers and encouraging the large scale livestock farmers and enterprises.

The production targets for the year 2020 are based on the figures proposed by the DOLF in accordance with the MAF's Vision 2020 as shown in Table 6.3. These figures are reasonable taking the

**Table 6.3 Livestock Development Target in 2020**

Livestock	Year 2000		Year 2020	
	Population (nos.)	Production (tons)	Population (nos.)	Production (tons)
Buffalo	1,028,000	16,600	1,527,000	24,705
Cattle	1,145,000	16,400	3,672,000	52,700
Pigs	1,325,000	27,650	2,393,000	51,406
Total Poultry	15,494,000	18,340	52,829,000	78,167
<b>Meat Total</b>		76,990		204,958
Eggs		10,000		40,793
Milk		270		1,202

Source: DOLF/MAF

present conditions into account and can be achieved by fulfilling the improvement measures and programs/projects proposed in this Study.

#### (2) Strategy for Livestock Development

The small-holder farmers will remain as the major livestock producers who raise the majority of animals. To increase their productivity, various measures for improvement have to be taken: ensuring animal health; improvement of the



traditional feeding and management systems; more effective use of land; introduction of fodder crops; securing of feed in the dry season; effective use crop by-products; improving the management of natural pasture lands that are being used; and improving animal breeds. To increase the productivity of large scale livestock raising, the same measures as for small-holders' has to be adopted, especially focussing on the quality and safety of feed, comprehensive hygienic management of livestock and improved housing facilities.

The average holdings of large livestock farmers (cattle/buffalo) would be increased to about 16 from the present eight (4.8 cattle and 3.1 buffaloes). This will bring a good income for small-holder farmers through constant shipping of two to three beef cattle per year. To meet the increased demand of feed, the natural pasturelands would be divided into two land use types: grass harvesting areas and grazing areas. Standing grass will be harvested during the optimum period and stored as silage for the dry season. The silo would be of a simple trench type dug in the ground and filled with grass inside plastic sheets and covered with soils. The agricultural by-products such as rice straw are cut and properly stored. In addition, other fodder crops should be introduced gradually. Such a feeding system will provide for the increase in livestock population, prevent weight loss during the dry season and earlier shipping, resulting ultimately in improved meat quality. Under this feeding system, the small-holder farmers are expected to have about 4 million cattle and buffaloes out of the targeted 5 million, by 2020.

For large scale livestock raising, the initial feeding capacity should be limited to about fifty animals to save initial investment costs. They may gradually improve the facilities and pasture land, and increase their livestock population. The livestock holdings would increase with the improved feeding and management techniques targeting 300 to 500 in number. In order to secure feed during the dry season, grass grown during the rainy season should be collected and stored as silage. The feed for the dry season would be mainly supplied from silage, then from grazing as supplemental feeding. The silo in this case will be a concrete bunker type suitable for large quantities, high working efficiency, quality maintenance and labor cost reduction. The production target of 1 million out of 5 million will be achieved by this production system.

The above total includes livestock in dairy farms. Although the dairy products demand is very small at present, and most is imported from Thailand, domestic demand is expected to increase in the future. The number of dairy cattle will increase more rapidly than beef cattle. The dairy farms will be operated in the

vicinity of large cities for marketing reasons. The milk processing factory will be of small scale with a capacity of about three tons/day to meet an annual demand of about 1,200 tons and the processed products will be limited to pasteurized milk, butter and yogurt.

For pigs and poultry, the target production level would be attained by a combination of traditional farmers and business-oriented large-scale production that is popular in the suburbs of large cities. For small-scale traditional raising, the average number of pigs per farmer is four and would be increased to six, and the number of poultry would be increased from 19 to 60. Consequently, small-scale farmers would raise 2.4 million pigs and 27 million poultry as a whole. Such scale of breeding can be realized even by family labor force and is considered manageable with the traditional system. Although the traditional varieties of poultry are suitable for extensive raising, the productivity should be improved by selective breeding.

Large-scale pig raising should be conducted in modern facilities and all feed would be purchased. As for the varieties of pigs, the National Pig Breeding Station is conducting a three-way crossing using advanced varieties and is distributing commercial hybrids. The number of this variety would be continuously extended. The scale will be 200 to 300 pigs per farm. Large-scale poultry raising should also combine modern facilities and excellent varieties, as for pig breeding. The proposed scale ranges from 10,000 to 20,000 hens for egg production and from 30,000 to 50,000 chickens for broilers. At the initial stage, however, the stock would be limited to 1,000 to 2,000, then gradually increased through improved skills. Consequently, 26 million poultry, about half of the 2020 production target, would be bred by large-scale operators. The main purpose of large-scale pig and poultry breeding is to supply products to cities. Therefore it is desirable to locate breeding facilities near such cities. It is important to pay due attention to environmental concerns to prevent odor, noise, and water pollution. When the products are intensively produced, it is necessary to provide meat processing facilities to meet city demands.

### (3) Implementation Process

The prime livestock producers are farmers and business enterprises. The government has to support them through solving the present technical and institutional constraints and facilitating new technologies to enhance livestock productivity as a whole. The role of the the government in this respect and proposed programs and projects are mentioned below.

(a) Animal health, livestock products hygiene and disease control

The strengthening of animal health control is an urgent issue. This includes the establishment of implementation laws and regulations on animal health, meat inspection and animal disease control, establishment of livestock hygiene information system, establishment of diagnosis laboratories, and strengthening/establishing export and import quarantine facilities. Since 1998, these activities have been implemented mainly in the northern region with assistance from the EU. Although this program is to be ended in 2004, the same activities should continue beyond 2004 be extended to include the whole country. In addition, it is necessary to strengthen basic research on animal health through the improvement of the existing national livestock hygiene center and establishment of vaccine quality test laboratory and contagious disease laboratory. Some programs, such as animal quarantine, will be conducted in cooperation with neighboring countries as regionally interrelated issues.

To fulfil these requirements, the following programs and projects are proposed as the priority ones to be started before the year 2010:

- 1) “Livestock Services and Extension Activities Strengthening”, being implemented with assistance from EU until 2004.
- 2) “Animal Health Improvement”, as a follow-up project of the above EU assisted project beyond 2004 to cover the whole country;
- 3) “National Animal Health Center Improvement”.
- 4) “Animal Disease Control Promotion Project in Indochina Region”.

(b) Upgrading of livestock productivity

This is to increase the livestock productivity through introduction of variety adaptation tests, establishment of livestock improvement and expansion systems, establishing a breed registration system and extension of an artificial insemination technology. It is also intended to develop adaptive technology by region for beef and dairy cattle, both of which will be rapidly increased, and these technologies have to be extended to farmers through providing training with government staff and farmers. In addition, it is desirable to introduce a livestock insurance system to compensate for the loss that occurs from livestock accidents, disease and slaughter of infected livestock, resulting ultimately in preventing the spread of contagious diseases.

To fulfil these requirements, a priority program entitled “Livestock Productivity Enhancement” is proposed. This program will be followed by three programs and projects that would be implemented beyond 2010, entitled:

- 1) “Animal Improvement and Breeding System Assistance”;
- 2) “Introduction of Animal Insurance System”; and
- 3) “Beef and Dairy Cattle Improvement Centers Strengthening”

(c) Feed production

To encounter the increased population of livestock, the feed production will have to be increased. A wide range of research and development is required in respect of: adaptability research for new fodder crops; development of post harvest treatment technology for fodder crops (drying and storage); establishment of fodder crops demonstration farms; and the development of technology for the sustainable use of pasture land. These activities will be undertaken by the above proposed priority program entitled “Livestock Productivity Enhancement”, followed by “Research Program of Fodder Crop Production and Sustainable Use of Pasture Land” in the 2010s.

(4) Expected Results of Livestock Development

A wide range of beneficial outcomes from livestock development is expected, as outlined below.

(a) Enhancement of livestock productivity

One of main themes of livestock development is animal health control; this is to be achieved through sufficient supply of vaccine, high level disease diagnosis, increased number of veterinarians, and prevention of epidemic diseases. Livestock productivity will be further enhanced by improved quantity and quality of feed within reasonable cost and adaptive farmers’ technology.

(b) Increase of farmers’ income

The prime livestock producers are small-holder farmers, expected to share about 80% of all cattle production in 2020. Most programs and projects target these farmers to enable them to produce more livestock through extension of animal health control and adaptive technologies. Since the domestic and international demands will surely increase, this will bring good income for livestock farmers through animal raising and promotion of rural processing industries.

(c) Capacity building and human resources development

The development programs and projects proposed here will stimulate both the public and private sectors as well as the farmers to participate in the beneficial livestock industry sub-sector. Thus, proper and timely implementation of the programs and projects is expected to strengthen the capacity of the central and

local government staff and to develop human resources in all the involved sectors.

(d) Stabilization of macro-economy by increased foreign currency earning

The institutional improvement will normalize the livestock trade with neighboring countries from the prevailing predominance of unofficial exports. In addition, there will be quality improvement of the livestock products under the proposed programs and projects. This will result partly in improvement of macro-economy of Lao PDR owing to increased foreign currency earning.

(e) Improved national health and sanitation conditions

The strict animal health and sanitary control will maintain the nation's health status. The high quality of livestock products will also contribute to improved nutrition.

## 6.6.2 Fisheries

### (1) Objectives of Fisheries Development

The fish catch from the Mekong River and its tributaries is decreasing year by year. To respond to future increases in domestic consumption, aquaculture has to be extensively promoted. At present, 90% of the aquaculture is run by small-scale farmers for self-consumption and is of low productivity. On the other hand, business-oriented aquaculture supplies products to the cities. However, this type of aquaculture also has constraints of low productivity and low technology.

Aquaculture has a wide range of objectives. In rural areas, it provides animal protein and provides farmers with income generation opportunities by selling surplus fish. Urban aquaculture has a role in supplying animal protein to city residents.

The production targets by the year 2020 are based on the figures proposed by the DOLF in accordance with the MAF's Vision 2020 as shown in Table 6.4.

**Table 6.4 Fish Production and Rate of Increase**

Description		2000	2020	Growth Rate
Fingerling Production	(million nos.)	140	800	571%
	(State owned)	(42)	(70)	167%
	(Private owned)	(98)	(730)	745%
Fish production	(*000 tons)	52	189	363%
	(Natural fish)	(28)	(28)	100%
	(Culture fish)	(24)	(161)	671%

Source: DOLF/MAF

These figures are reasonable, taking the present conditions into account and can be achieved by fulfilling the improved measures and programs/projects proposed in this Study.

## (2) Strategy for Fisheries Development

Fish production by aquaculture will be based on two types; rural small-scale culture and intensive urban culture. The target production of 161,000 tons would be shared by rural and urban producers with; 80% of target production (128,000 tons) from rural areas, and 20% (33,000 tons) from intensive urban production. The water body area was estimated at approximately 800,000 ha as of 1998, consisting of about 260,000 ha on the Mekong and its tributaries and 540,000 ha in reservoirs (80,000 ha), wetlands (27,000 ha), fish ponds (14,000 ha) and paddy fields (419,000 ha). The potential of these water bodies will be fully exploited for aquaculture by 2020, and the expected production from the respective water bodies are assessed as 33,000 tons from urban fish ponds (with increase of 23,000 ha from the present 14,000 ha), 60,000 tons from reservoirs, 20,000 tons from caged fish culture in river, and 48,000 tons from rural aquaculture.

Production of commercial fingerlings would increase by about six times from the present 140 million to 800 million by 2020. During the same period, the present survival rate of commercial fingerlings of 15% would increase to 40 to 50% through improved production technology and transportation. Out of required 800 million fingerlings, 70 million would be produced at the 30 national hatcheries and 730 million would be produced at private hatcheries.

However, both rural and urban aquaculture share common constraints on productivity and various measures to improve production have to be taken. These include: increased survival rate of fingerling; use of proper water body and adequate culture density; rehabilitation of fish ponds to maintain proper water depth; supply of adequate feed; fish feeding combined with small livestock raising; and promotion of dry season feeding by securing water resources.

## (3) Implementation Process

Like livestock development, the government has to support fish producers through solving the present technical and institutional constraints and facilitating new technologies to enhance productivity as a whole. Three projects are formulated to fulfil the supporting requirements as mentioned below.

### (a) Aquaculture Improvement and Extension Project

This project aims at improving extending culture technologies to enhance the productivity. The project started in February 2001 with technical assistance from JICA as a three-year program. It includes the establishment of an aquaculture center at Namxouang in Vientiane, preparation of training and

extension programs on culture technology, seed production, and experiments of culture and breeding technologies. After 2004, it should be followed by a second phase project to further strengthen the improvement of culture technologies. The second phase would include the production of improved progeny of target species (tilapia, common carp, and puntinus catfish), establishment of a proper aquaculture system, and the provision of demonstration and fingerling production farms at the culture center.

(b) Fish Seed Center Rehabilitation/Expansion Project

This project is to establish or to rehabilitate aquaculture centers in eight selected provinces, and to develop the capability of officers for technology improvement and extension activities in the field of aquaculture. The main components are to experiment with seed production and aquaculture techniques and to extend the selected seeds and technologies.

(c) Rural Aquaculture Development Project

This project is to develop aquaculture in rural areas of 12 selected provinces through the provision of appropriate technologies, equipment, training and funds for rural investors and farmers' communities. Various types of aquaculture would be promoted; these are pond/reservoir culture, rice-fish integrated farming, cage culture and fish-livestock integrated culture. The project also includes the micro credit to fish feeders through revolving funds and the development of mini-fish-feed mills.

Fish production by aquaculture is rapidly growing countrywide, particularly in rural areas, as the quickest way to increase rural incomes and to increase animal protein intake. However, its productivity and technology remain at a very low level. Moreover no statistics are available to show the nationwide conditions of fish culture and related industries. Therefore, all three projects, including on-going JICA assisted project, have to be started before 2010.

(4) Expected Results of Fisheries Development

Almost the same benefits as for livestock development are expected from fisheries development. These are: increased fisheries productivity; increase of farmers' income; capacity building and human resources development; and improved national health. Increased rural income, in particular, is the highlight in the projects' outcomes, contributing to a reduction of rural poverty.

## **6.7 Stabilization of Shifting Cultivation through Agro-forestry, NTFPs and Related Livelihood Activities**

### (1) Development Objectives

Shifting cultivation is part of a complex livelihood support system developed by upland communities in hilly areas. These traditional livelihood systems rely heavily on the use and management of a diversified range of natural resources as outlined in sub-chapter 3.2.7. Changes are occurring through migration, increasing population, increasing controls on access to forestland and expanding opportunities for trade and access to manufactured goods.

Based on government statistics, in 1995, there were 198,868 families practising shifting cultivation with an annual area cropped of 192,258 hectares. By 1998 the number had fallen to 140,800 with 142,785 hectares under annual crops. The reduction in long rotation shifting cultivation is occurring as both population pressures and containment of agricultural land lead families to adjust to shorter cropping/fallow rotations on reduced areas.

A Department of Forestry National Reconnaissance Survey made in 1992 indicated the area under upland crops 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 about 330,000 families cropped about 689,000 hectares. The majority of upland cropping is in fact some form of shifting cultivation. Under a 3-5 year rotation the total area of land used in the cycle is about 2-3 million hectares.

The differences in figures for shifting cultivation and upland cropping areas are explained by the classification of shifting cultivation types. In the past, most upland cropping was either in a long (15-20 year) swidden / bush fallow rotation or a pioneering slash and burn shifting cultivation system. Under this regime it is regenerated secondary forest which is opened for the cropping phase – this is sometimes referred to as *slash and burn* agriculture. As mentioned above, the influences of population increase and containment of agricultural land have drastically shortened fallow periods to 3-5 years, with no time for forest regeneration. As indicated, areas of upland cropping in this transitional rotation system now constitute the majority and an increasing proportion of upland cropping, with shifting cultivation declining.



The current government target for shifting cultivation is for further reduction to 29,400 hectares by the year 2005 and to zero by the year 2010. Of primary significance is a need for the control and containment of agricultural land to enable re-afforestation targets to be met and the country's '*high-forest*' cover to increase from the current 45% to 60-70% by 2020.

Whilst the statistics illustrate a significant reduction in shifting cultivation, the general experience is that upland communities are not effecting commensurate changes in farming systems to maintain productivity and living standards with these short rotations and shortened fallows. 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 such communities. The surrounding forest areas will come under increasing pressure to supply more products and farmland. Interventions are therefore vital to facilitate development and adoption of sustainable agro-forestry and other livelihood systems.

The government has recognized that the above changes are having a major impact on upland livelihood systems. In response the government has established strategies as outlined in the Strategic Vision for the Agricultural Sector. These are designed to facilitate ***stabilization*** in shifting cultivation areas through participatory programs to assist upland communities develop sedentary sustainable farming systems and other complementary livelihood opportunities.

Based on the above vision, the objective is to stabilize of shifting cultivation through: i) development of sustainable land-use systems which are non-hazardous to the environment and ii) development and expansion of off-farm income generating activities. *Sedentary* upland livelihood systems, whilst they will remain diverse in nature will involve intensified and permanent use of allocated land, as opposed to the traditional extensive swidden rotation systems.

## (2) Development Strategy

Based on the above objective, the development and adaptation of upland farming and livelihood systems at the village/community level is required. The major areas for the development and adaptation are identified as: -

- Appropriate land-use planning based on altitude, slope, soils and rainfall.
- Appropriate farming systems development including agro-forestry, conservation measures, livestock and fish.
- Development of sustainable management and utilization of NTFPs.

- Development of other off-farm income generating potentials.

This section addresses the formulation of proposals for village/community level interventions to fulfill the objective of shifting cultivation stabilization. In addition to agricultural pursuits, there are a range of possible area specific off-farm income activities such as apiculture, sericulture, weaving, papermaking, brick burning and agricultural processing. In combination with agricultural pursuits, these provide additional opportunities for improving livelihoods. Such activities are considered in relation to the development of sustainable sedentary livelihood systems, with a reduced reliance on forest resources.

The goal of stabilisation should not imply that communities cease production of upland rice. In remote mountainous/upland areas, subsistence rice production will always have a high priority. The value of rice in the hills is greater than its market price in lowland areas, due to transportation costs and other constraints.

Important in project approaches for the development of sustainable sedentary livelihood systems is the recognition that: -

- Community participation in the process is essential and necessary.
- Upland livelihood systems will remain diverse and include: agro-forestry (crop, livestock and pastoral) systems, aquaculture, NTFPs, and other area-specific off-farm income generating potentials.
- Progressive improvements will be through careful problem and opportunity identification followed by testing, adaptation and adoption of proposed solutions.
- Solutions that can be applied as progressive improvements or developments based on existing practices, will be most easily assimilated and adopted.

In all these areas, participatory extension processes are needed to initiate and facilitate community participation in identifying problems and opportunities. Linkage with research, demonstration (including farmer to farmer training) and other technical support units is also required to enable technology development/adaptation.

The 'Vision' identifies these requirements, but recognizes that the current extension and research organization needs development and capacity building. In addition to developing research and extension, there is a range of other services and components needed. These can be described as '*pre*' or '*enabling*' conditions for facilitating upland community self-reliance in sustainable adaptation to changing circumstances. These pre-conditions include:

- Rural infrastructure and services development – health and family planning, education, roads, electrification etc.
- Institutional and human resources development - research and extension.
- Land-use classification – based on soil & land suitability and soil testing.
- Land allocation and village land-use plans – as developed for shifting cultivation areas both inside and outside NBCAs.

Among these, activities related to land tenure and use are very important in providing family security and incentives for sustainable development of upland areas. A national land allocation program, providing formal family land-use rights, allocates agricultural land by means of Temporary Land-Use Certificates (TLUCs). The current situation and proposals for addressing the development of these *enabling* factors are covered in other sections of the report with a cross reference of proposals provided in the Action Plan.

### (3) Implementation Process

For the short to medium term, 2002-2010, there are 4 additional major program/projects proposed in this Master Plan Study. These address areas of need which are not so far catered for by on-going and currently planned projects, but are necessary for country wide progress towards the goal of shifting cultivation stabilization by the year 2010. Two additional follow-on projects are identified for the longer term period, 2011-2020.

#### Short Term Strategy

##### 1) Stabilization of Shifting Cultivation in Upland Areas

This program consists of the following three projects. This set of 3 projects, when considered jointly with on-going shifting cultivation projects and watershed programs, provide a substantial coverage of the major shifting cultivation areas in the country. Altogether these will occupy the major part of the country's implementation capacity for shifting cultivation stabilization projects.

##### (i) Stabilisation of Shifting Cultivation in the Southern Region

This project relates to a program of technical assistance to area-based projects in three southern provinces of Salavan, Sekong and Attapeu. In these provinces some commercial activities pursue the development of tree/shrub crops (coffee & tea). This project is needed in the interim while the country's extension and research services are reorganized and develop capacity.

(ii) Stabilization of Shifting Cultivation in the Northern Region

This is a program proposal formulated by UNDCP and the Lao National Commission for Drug Control and Supervision (LCDC). It is entitled “A Balanced Approach to Opium Cultivation” and will run to 2006, the target for eliminating opium poppy cultivation. It provides for 15 ‘Pipeline Projects’ in 15 opium-producing districts in the 6 northern provinces of Phongsali, Oudomxai, Luang Namtha, Houaphan, Xieng Khouang and Luang Prabang. Assistance requirements past 2006, to consolidate and strengthen community self-reliance and adoption of improved farming systems, will need to be assessed towards the end of the program.

(iii) Upland Development and Poverty Alleviation Programme

This is a proposal under preparation by MAF for appraisal by SIDA. It is for an Upland Development and Poverty Alleviation Program. Provinces that may be covered are Luang Prabang, Savannakhet and Sayaboury.

2) Stabilization of Shifting Cultivation in NBCAs

This program would be entitled as “Participatory Farming System & Livelihood Development in NBCAs” that provides for livelihood development and shifting cultivation stabilization inside 10 NBCAs. These have been identified as facing current threats from shifting cultivators, but have no ongoing project or other assistance planned.

3) Agroforestry Research / Extension Linkage

This program provides for agroforestry research-extension linkage for technology assistance to undertake on-farm (farming system) adaptive research activities. Initially this activity will commence in liaison and cooperation with area-based projects in target districts and villages. As initiatives show promise, there will be a gradual expansion to additional villages and districts.

4) Sustainable Management and Utilization of NTFPs

This program provides for research to develop sustainable management and utilization of NTFPs for subsistence needs and off-farm income development. Current livelihoods are supported by a diverse range of NTFPs which are currently being over exploited for subsistence and income needs. Another

NTFP related project in marketing sub-sector provides for marketing and processing studies. Together these projects will examine and identify priority NTFPs for further attention in production management, processing and marketing.

This short term strategy emphasizes continuing development of past and on-going efforts. Of particular importance will be the improvement of information transfer between stakeholders at all levels in relation to on-farm sustainable production technologies and the development of off-farm income.

### Medium and Long Term Strategy

It is recognized that development and adaptation to change is an on-going process. Consequently there will be a need for a continuation of programs of technical assistance past the year 2010. These needs should be reviewed periodically in the light of progress and achievements. Regional experience with similar projects indicates continuing long-term support will be required. In the longer term, three follow-on projects have been identified to expand and promote findings to all upland communities.

- 1) Expansion of Agro-forestry & Sustainable Land-use Demonstrations
- 2) Expansion of Extension in NTFP Management and Conservation
- 3) Networking Technologies for Stabilisation of Shifting Cultivation

The former two programs are identified as sequential to related projects in the first phase. These projects will build on Phase 1 results and achievements through expanding their application to wider areas. They are proposed in the recognition that the capabilities and capacity of the extension and research services will be enhanced throughout Phase 1, thus, they will be capable of expanded and focused work.

The last one is for networking to improve information interchange between the parties involved in shifting cultivation stabilization. Networking activities will relate to land-use technology development and income generating opportunities. For example, government programs and procedures exist to promote on-farm tree seedling production and tree plantations, but are not widely accessed by small holders in the uplands. In addition, there are projects and community innovators testing and adapting a range of enterprise options throughout upland areas. Upland community access and uptake of these potentials can be accelerated through better

information interchange coupled with packaged targeted extension promotion material and logistical support.

#### (4) Expected Results

Outputs in line with the strategic vision's policies, strategies, and priorities will initially be achieved in the projects' target areas. As methodologies and technologies are consolidated they will become available for application in wider areas.

Outputs in project areas will be systematic land-use planning based on land suitability classifications using slope, soil, altitude and climatic criteria. Within these areas research-extension linkages for coordinated adaptive work with upland farming systems will progressively identify systems and options to stabilize and diversify upland farming. These developments will reduce soil erosion and run-off to facilitate sustainable production of rice and maize, other cash crops, permanent tree crops, livestock and fish.

Other parts of the program deal with developing off-farm income generating potentials. Of major importance is NTFP sustainable management and utilization, processing and marketing. The outcomes here will be a widening adoption of sustainable management methods for key indigenous NTFP resources to provide for family consumption needs and to provide added income while conserving biodiversity.

## **6.8 Marketing and Agro-processing**

### (1) Development Objectives

The major objective in agricultural marketing under the proposed Action Plan is to provide for an enabling market environment so that producers, consumers and the agribusiness community can make decisions within the framework of the market economy. This objective is to be supported through provision of facilitation and regulatory services and market information to assist in free and open competition, transmission of market signals and promotion of goods and services and thereby increase internal and external trade.

The major objective of agro-processing are; i) to improve quality and reduce loss of agriculture products through proper post-harvest activities including collection, sorting, storing, drying, packing transporting etc.; and ii) to add more value to agricultural products.

The critical factors influencing the achievement of this objective are the provision of facilitating services for the movement of produce and the removal of controls and regulations that hinder free and easy movement of goods and services.

As outlined in the Government's Strategic Vision for Agriculture, sloping lands lack market access and the majority of farmers do not market their produce due to the lack of access roads and other basic facilities. In the short term, the major objective is to provide for market access for both domestic and foreign markets so that producers can exploit market opportunities that have been constrained by lack of facilities. Also, in the short term an objective is to provide market information so that producers, consumers and the agribusiness community will be better informed about market potential and opportunities.

In the longer term, the goal is to provide the facilitation and regulation necessary to reap economies of scale through grading, standardization and standardized packaging, and conform to international standards for hygiene and health regulations. The objectives will be to improve marketing of perishable commodities, facilitation through improved agro-processing, input marketing and exploit the potential for an increased market share in the production of goods and services in the Mekong Corridor area following conformity with AFTA guidelines for freer trade.

## (2) Development Strategy

The major strategy for achievement of the objectives for agricultural marketing is the provision of better market access, market information and services, removal of market distortions and provision of facilitation and regulatory services where necessary in the interest of trade and market expansion.

The strategy will be pursued through actions on three main fronts. Namely through the provision of market access roads, especially in the sloping lands and remote rural areas; the provision of market information; and setting up grading and standards system to enhance marketability and product unseen trading. These approaches will be pursued sequentially during the period of the Action Plan.

The strategy fo agro-processing development to the provision of technical training, rural credit for purchasing equipment and the establishment of facilities, and formulation of group activity at community level. These support services will be provided through various crop promotion programs as well as the Village Led Agriculture Development Initiative Program. In addition, training for agro-

processing will be made in farmers' vocational schools to be attached to the Regional Agriculture and Forestry Training Centers as well as the Post-Harvest and Agro-Processing Technology Center.

### (3) Implementation Process

Implementation emphasis will primarily be through improving the farm to market road network. For the majority of rural families the nearest access road is 6 kilometers away. It is estimated that 12,000 kilometers of rural roads will be rehabilitated and 7,200 kilometers of new roads will be built under the Action Plan. The phasing of the program emphasizes on new road construction in the period 2001-2010 based on the criteria of the distance of population from the nearest road access. This program is shown under the section on rural development although these are largely market access roads. Farm to market roads are given emphasis because of the need to provide market access for many farm households that remain subsistence oriented mainly due to the lack of market access.

The plan also provides for setting up of a commodity market intelligence system as short term strategy. There is some preliminary work currently being undertaken under donor assisted technical assistance to study the framework for such a facility. The system would use the media for transmission of commodity information, especially price and volume information to inform producers, traders and processors of the availability, location and prices of farm produce on a daily basis. The market information system will establish a network to collect price and volume data from various production, wholesale and retail points. The system would also monitor and report on trade in agricultural products across national borders. This will provide information on volume, product specifications and prices of commodities traded internationally.

Also, in the short term, it is proposed that a start is made on the establishment of product grades and standards for livestock and agricultural products. Such a system would enable and enhance export competitiveness as well as facilitate the sale of agricultural produce. In particular, such a system when well developed should enable sight unseen trading both nationally and internationally.

In view of the comparative advantage as well as the overall competitive position of several commercial crops, a project has been scheduled early in the Action Plan to study the potential markets, especially export markets for a range of agricultural commodities such as tropical seasonal fruits and vegetables. The project would also



provide a facility, based on these studies, for technical advice to potential producers as well as advice on markets and marketing of produce.

Non-timber forest products (NTFPs) have become increasingly important as a source of export income and the potential exists for a sizeable expansion in their production and export of NTFP. The promotion of NTFP will also provide increased income for rural people. Although NTFP production has increased, no detailed study has been undertaken to assess the potential for such products. A project has been included to study their market potential in both domestic and international markets. Such a study would also examine the potential for processing and value added activities.

The Action Plan also provides for setting up a facility as a long term strategy for assisting community based agro-processing activities by carrying out a survey of raw materials and processing and market potentials as well as profitability of such activities. This will provide training to rural community in agro-processing activities with potential to supplement rural incomes. It is proposed to link this activity with the micro finance project and provide credit facilities for rural communities to start agro-processing activities. Another proposal is to assist farmers groups to bulk purchase inputs and sell outputs so as to realize greater bargaining power and better market prices. The Action Plan provides for establishing a Food Hygiene Standards and Inspection System. This provides for testing equipment, staff training in food hygiene standards and inspection systems to quality control checks in food processing facilities.

Several agro-based value added activities have the potential for development but there is a lack of technical knowledge of the potential, the equipment, the machinery and raw materials. Small business enterprises need assistance through the provision of information on processing and post harvest activities. Also, these enterprises can be provided with information as well as feasibility studies on various agro-processing activities, markets and sales and market assessments. This will and even assist entrepreneurs to find buyers for products in both domestic and export markets. A small business Enterprise Center is proposed under the Action Plan in the long term strategy to provide these services for small enterprises

#### (4) Expected Results

The major impact is expected from the construction and rehabilitation of rural roads. The rural road improvement program will open up the rural areas, provide a market for surplus farm produce and for purchase of inputs and provide incentives for

increased production. The road program will also provide easier access to social amenities such as education and medical services.

The market information system is anticipated to provide better market information that should assist producers, processors and consumers with better decision-making and price signals. Better market information should also provide better market and price forecasting and perhaps increase the market power of farmers.

Technical training on post harvesting and agro-processing and micro-finance will create several agro based value added activities. As a result, the farm income and rural economy will be enhanced.

## **6.9 Rural Finance**

### **(1) Development Objective**

The primary objective of the rural finance program is to make available institutional rural financial services to a large segment of the rural population. In a recent survey, 95% of farmers indicated that their financial needs were not being met by existing financial services. In addition, 91% of farmers have some form of financial savings but only 1% had any deposit savings in banks or rural savings groups. In addition, 90% of credit is obtained from family, friends, moneylenders and village revolving funds and only 10% from banks.

The major objective is to be achieved by making existing financial institutions and new financial institutions cater to the needs of the rural sector through new and innovative deposit mobilization mechanisms and loan products. The only financial institution serving the needs of the farming population covers only 10% of the farmers in Lao PDR and the commercial banks are not extending large services or providing loan products tailored to meet the needs of the farming community.

The State Owned Commercial Banks (SOCB's) are in a weak financial position, have limited expertise and staff and a low level of savings and time deposits. The Agricultural Promotion Bank now provides loans to about 5% of rural families. However, it is beset with many financial management, loan operations, loan recovery and business development problems. APB relies on the government for funds for about 80% of its lending. In the short term, it is necessary to make the commercial banks and Agricultural Promotion Bank better serve the needs of the rural families.

## (2) Development Strategy

The strategy is to improve the overall efficiency of the existing financial institutions through restructuring and corporatization and make them adopt banking practices more oriented to meet the needs of rural families. In the short to medium term this would mean improving the financial position of the banks, improving management and accounting systems, credit risk evaluation, appraisal of borrowers and cash flow analysis. There should also be a drastic change in APB policies and operations and the elimination of government subsidies for agricultural credit. There should also be training of bank staff in commercial banking practices.

In the longer term, there should be the establishment of savings and credit groups through an evaluation of the on-going village revolving funds to transform the viable, more efficient ones to savings and credit groups. A micro finance system to service the needs of rural families in competition with the other banks also needs to be set up. The UNDP Micro finance Project currently underway is a good starting point.

## (3) Implementation Process

In the short term, it is proposed that the process of assisting the SOCB's to introduce better commercial bank practices should be continued and donor assistance in this regard is expected to continue. This should make possible the improvement of the operational performance of SOCB's. Training of SOCB staff has already been going on at the Bank of Lao PDR Training Center and this training as well as training of trainers is scheduled to continue and will upgrade the technical capacity of all bank staff. The restructuring and corporatization of the SOCB's as well as improvement of the operational performance of SOCB's should enable SOCB's to expand its branch network and its deposit mobilization mechanisms so as to expand its deposit base and its lending. Technical assistance is proposed to assist the SOCB's in this regard. In addition, it is proposed that loan products for the fishery and livestock sub sectors would be developed and pilot tested by the SOCB's.

Technical assistance is currently being provided for the restructuring of the APB and a diagnostic study of all aspects of the APB operations, including deposit mobilization and loan policies and procedures are being studied. A detailed report with recommendations to reform APB is expected quickly. It is proposed that the recommendations be implemented in the short to medium term under a project by an international development bank, with recapitalisation, if required. Following the restructuring of the APB, it is proposed that a project be implemented to introduce

loan products specifically designed for the rural sector, either using the group approach or mobile credit officers with the intention of keeping the cost of servicing the loan competitive and comparable to branch bank loan servicing costs.

In the medium to longer term it is proposed that the SOCB's also follow the APB in providing loan products to the rural sector using mobile credit staff and group methodology with the purpose of keeping the cost of servicing these loans competitive with other loan products.

A proposed project is to carry out an evaluation of all the village revolving funds to identify viable and profitable VRF's that could be transformed into savings and credit groups. Following this evaluation it is proposed that a project be set up to legally make the selected VRF's into Savings and Credit groups. These groups would be provided training at the Micro finance Training Center. The establishment of new savings and village groups would be encouraged under the proposed project. At the same time, the UNDP funded Micro Finance Project should be extended to cover several provinces and should be buttressed by the establishment of a separate bank for micro finance savings and loans.

#### (4) Expected Results

It is expected that the actions on reform and restructuring of the SOCB's is likely to be a process that will take many years. Re-structuring and corporatization when completed would lead to actions on development of loan products to meet the needs of the farming community. The restructuring of APB is also likely to take place only after the recommendations of the diagnostic study have been accepted and actions agreed to by the authorities and this is likely to take many years. There would be implications for staffing of these banks as well as the possible need to write off non-performing loans. However, though the expected results are likely to be delayed and slow the medium term result is likely to be a more efficient banking system that also caters to the needs of the farming community.

The development of the microfinance system and the transformation of the savings and credit groups into viable rural financial institutions is also likely to be a slow process involving capacity building. However, in the long term it is expected that there would be many efficient and well functioning savings and credit banks with a micro finance bank in place.

On the legal front, the legislation for debt recovery and security enforcement and the legal basis for bills of exchange and promissory notes and leasing as well as

introduction of the deposit insurance scheme and credit Information Bureau would all assist in a more enabling environment for banking to extend to the rural areas.

## **6.10 Rural Development**

### **(1) Development Objectives**

According to results of the Lao Expenditure and Consumption Survey 1997/98 (LECS), there is a wide disparity between the rural and urban areas in Lao PDR in socio-economic indicators. For example, households with access to clean water (piped or protected well) are 77% in urban and 45% in rural, villages with access to main road are 100% in urban and 44% in rural (in rainy season), villages with electricity are 91% in urban and 19% in rural, and villages with complete primary school are 60% in urban and 42% in rural. In the light of such poor infrastructure availability in rural areas where more than 80% of the population live, rural development has been an important issue for a long time. From the above point of view, a similar program for on-going rural development through the focal site approach should be implemented continuously in the future. This program for the rural development would be implemented in remote and isolated poor villages with the object of developing rural infrastructure in order to alleviate rural poverty and improve the livelihood of the rural population. With this program, several types of social infrastructure such as rural roads, school buildings, health facilities, and water supply facilities would be constructed based on the needs of local populations living in isolated poor villages.

For potential rural agriculture development areas, however, a different approach aimed at economic development is needed, because the poverty alleviation approach does not always give priority to economic development. With the economic development approach, priority would be given to market-driven agriculture development in potential area. Rural roads are thus major rural infrastructure to be provided under this approach. Rural roads are an essential element for accessibility improvement in remote areas. The result of an analysis made on LECS data shows that there is a high correlation between poverty (including agriculture income) and poor accessibility<sup>2/</sup>. The objective of rural development under this approach is thus to promote market oriented agriculture in potential rural areas through agricultural development to increase living standards

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<sup>2/</sup> The correlation coefficients between the poverty incidence and other indicators are calculated using LECS data. As a result, the poverty incidence has high correlation between poor accessibility and expansion of slash and burn farming. It can be evaluated that many rural villages with poor access are in poverty and depend on slash and burn agriculture.

and reduce poverty in remote villages. With this approach, present subsistence agriculture in remote villages would be converted into market oriented agriculture.

## (2) Development Strategy

In order to achieve the above objectives for rural development, the strategy is as follows:

### (a) Overall Strategy

- Each program for rural development should be carried out at the province level in accordance with the decentralization policy.
- The bottom-up participatory planning and implementation process approach should be adopted.
- Weaknesses of the on-going focal site approach should be improved in implementing the proposed rural development programs. These include lack of clarity in roles and responsibilities among the related agencies, non-availability of monitoring and evaluation systems, inadequacy of staff capacity in relevant agencies for planning, management, coordination and supervision activities.

### (b) Strategy for Market Orientation Agriculture Development Approach

- The selection of potential area is one of the important subjects under this approach. The selection should be made based on data/information related to land, water and human resources as well as those related to agricultural (PAFS/DAFO) and road distribution conditions (MCTPC/DCTPC). High potential areas should be selected carefully by analyzing these data/information. In this context, data produced by the ongoing project of Integrated Rural Accessibility Planning (IRAP) will be very useful for selecting potential areas.
- In addition, the degree of villagers' initiative or intention for the development should be carefully confirmed by applying the participatory survey process. Village initiative would be a key factor for market oriented agriculture development.

### (c) Strategy for Poverty Alleviation Approach

- Target areas for development should be selected based on clearly established selection criteria. Attention should be paid to the selection of potential areas where constructed rural facilities are effectively utilized by the beneficiaries. In this context, priority for selection should be given to comparatively high population density areas, although in some areas low population density areas are being selected under the on-going focal site approach. By selecting promising areas for development, further donor assistance could be expected.
- Women's participation should be promoted in PRDCs and PRDOs in order to take measures on gender issues in the bottom-up participatory planning and implementation process.

### (3) Implementation Process

For the implementation of rural development with the above objectives and strategies, two programs are proposed for execution within the frame of the market orientation agriculture development approach: i) Village-led Agriculture Development Initiative in Remote Rural Area, and ii) Integrated Agricultural and Rural Development Project in Boloven Plateau. In addition, within the frame of the poverty alleviation approach, iii) Area-based Integrated Rural Development Program is also proposed for execution.

#### (a) Village-led Agriculture Development Initiative in Remote Rural Area

This program is proposed for the promotion of market-driven agriculture development in potential rural areas. This program focuses more on potential area development than the latter program which focuses more on poverty alleviation. The degree of village initiatives is also an important criterion for selection. The program will focus on the rural road rehabilitation and/or development. However, other rural infrastructure such as small-scale irrigation facilities, marketing infrastructure, electrification and water supply facility will be also provided based on people's needs that will be confirmed in the participatory survey to be carried out at the initial stage of the implementation. Agricultural extension and micro-finance services will be provided together with rural infrastructure/facilities for the promotion of commercial production, including agro-processing. Therefore, in the extension service, empowerment of the rural population for market-driven agriculture development will be an important element. In order to do this, demonstration plots and open-air schools will use farmer fields in selected villages. In this context, a training program for PAFS/DAFO staff will be another important component of the program. It is possible to combine this program with other projects/programs proposed for the market-oriented agriculture development, including the Agricultural Commodity Market Intelligence Project, Fruits Crop Promotion Program, and Sericulture Development Project. At this stage, the target number of villages to be covered by the program is set at 300 for the first 9 years and another 300 for the remaining 10 years.

#### (b) Integrated Agricultural and Rural Development Project in Boloven Plateau

This project was formulated by the master plan and feasibility study conducted by JICA during the 1995-96 period. The present study reviewed the feasibility study outputs based on changes of socio-economic conditions in the Boloven Plateau. The review was carried out covering several aspects including agriculture, agro-economy and engineering. A participatory survey was also

carried out for the review of farmers' needs for the development. As a result, the basic concept established in the feasibility study for the agricultural and rural development was confirmed to be still applicable, and all the 16 schemes identified by the feasibility study were proposed for implementation within the frame of rural development. In the implementation, priority was given to two schemes of Upper Champi and Upper Tapoung taking socio-economic changes in and around the Boloven Plateau into account. These two schemes will be implemented as pilot schemes among the 16 schemes. The proposed components include i) farm to market road rehabilitation, ii) demonstration farm construction, iii) NAFRI research and trial station construction, iv) social infrastructure construction (school buildings, rural water supply facilities, market facilities, etc.), v) technical assistance for detail design and construction, vi) technical assistance for management of NAFRI, and vii) technical assistance for agriculture development such as extension, water management and marketing management.

(c) Area-based Integrated Rural Development Program

The Area-based Integrated Rural Development Program would be implemented within the framework of the on-going focal site strategy. However, there is still considerable scope for improvement as described above: this should improve implementation. Under this program, rural infrastructure/facilities such as rural roads, school buildings, health, and water supply facilities would be improved based on the needs of the local population in selected poverty villages. All the provided infrastructure and facilities is aimed at improving social indicators in selected villages. In order to operate and manage the program effectively, training of staff in PRDCs/PRDOs and in relevant district offices will be provided under the program. In addition, the program will provide villagers training on operation and maintenance of the project facilities. The target number of villages is set tentatively at this stage at 1,500 for the first 9 years and another 1,500 villages for the remaining 10 years. These targets were selected after referring to 950 targeted of beneficiary villages in the on-going rural development program for the period of 1995-2000.

(4) Expected Results

(a) Rural Development by Market Orientation Agriculture Development Approach

The proposed extension and micro-finance services will ensure the production of commercial produce not only on rehabilitated, but also in other upland and lowland agricultural land. The improved rural roads will then support the



farmers to market products. Marketing information on potential products will also be provided through the extension service. Although commercial sale will be on small scale first, this will be increased gradually by using collection points to be provided by the program. The collection points will possibly organize the farmers into marketing groups for the sale of their products jointly. Moreover, proposed micro-finance will encourage farmers in investment in creation of alternative income sources in which livestock, fishculture, poultry, cultivation of fruit trees, and even agro-processing business would be included. The expected results or benefits from the proposed project are enumerated as follows:

- Expanded market-oriented agriculture in remote rural areas,
- Improved farmers' production technology in higher value products,
- Increased supply of market-oriented produce both to external and internal markets,
- Increased income and improved living standard of farm households,
- Improved capacity of PAFS/DAFO staff in project planning and implementation.

(b) Poverty Alleviation Approach

The primary goal of the proposed program is rural poverty alleviation where social development indicators are far below the urban areas. The proposed program is thus implemented principally for the development or improvement of rural infrastructure that brings better living conditions. Although the expected impacts would vary much in different target villages (or target village clusters), the proposed program would improve the rural conditions regarding health & sanitation, education, transportation and communication. In addition, similarly with the another program of Village-led Agriculture Development Initiative in Remote Rural Area, the provision of rural roads would accelerate income generation activities in remote rural areas. Moreover, empowerment of villagers and village communities is expected to enhance the operation and maintenance of the project infrastructure/facilities.

## **6.11 Irrigation**

(1) Development Objectives

Based on the "Government's Strategic Vision", the objectives for irrigation development and management are as follows.

- 1) To ensure food security by improving productivity under irrigated agriculture.
- 2) Poverty alleviation in remote areas by generating cash income through the introduction and promotion of irrigated diversified crops.
- 3) Shifting cultivation stabilization and the protection of watersheds.
- 4) To assist Water Users' Association (WUA) through training, organizational strengthening and institutional set-up under IMT process.

## (2) Development Strategy

Since the issue of the Prime Minister's Decree on "Full Transfer of Irrigation Project to Community Organization" in 1998, the government has been trying to adopt IMT policy nationwide for all irrigation schemes. The aim is to transfer the ownership as well as associated costs to beneficiary farmers and to reduce subsidies. At present, however, because of the deterioration of existing irrigation and other related facilities and a lack of farmers' incentives due to the low market prices of rice and alternative crops and also a small market demand particularly in the rural area, cropping intensities in the dry season under irrigation are quite low. Therefore, the rehabilitation of existing facilities in parallel with strengthening of WUAs to recover and upgrade their functions is critically important before IMT materializes.

However, according to the government strategy, the irrigation area should actively be expanded to achieve a target of 800,000 ha in the wet season and 400,000 ha in the dry season by 2020. However, the preliminary projection on paddy/rice balance for 2010 and 2020 in Table 3.15 shows that self-sufficiency can be maintained by improving the productivity of existing irrigation schemes. Also, these irrigation activities should be conducted under IMT as mentioned above. Therefore, the rehabilitation, upgrading and strengthening of existing irrigation schemes should be implemented with higher priority. However, at the same time, it should be considered that the potential area, as well as the water resources to be exploited by other sector could be effectively utilized for the agricultural sector. Therefore those areas should also be considered for future development, since the market status not only in Lao but other neighboring countries in the future is cannot be predicted, and thus there might be a necessity to increase the food production drastically.

In addition, emphasis should be given to flooding, especially irrigation facilities in flood-prone areas along the Mekong River tributaries in Vientiane and central-southern provinces. Therefore, flood mitigation measures should be urgently executed under this irrigation sub-sector to secure food production.

The Action Plan (A/P) for the irrigation sub-sector is therefore formulated with the following concepts:

1. *Rehabilitation and expansion of small-scale irrigation schemes in parallel with required support to WUAs. This should be carried out to improve productivity under the IMT process.*
2. *Effective utilization of water resources with introduction and promotion of high-value crop production to generate cash income for farmers.*
3. *Protection of agricultural production and properties including irrigation facilities in flood-prone areas along tributaries of the Mekong River should be urgently implemented.*

Based on these concepts, the following major sub-components are proposed:

- 1) Small-Scale Irrigation Development and Management through supporting Irrigation Management Transfer (IMT)

To succeed in the implementation of IMT, there should be irrigation rehabilitation and WUAs strengthening. Institutional strengthening should be actively continued to help recover and upgrade the function of existing schemes. This should be implemented in a strategic manner, based on the information given by TA on IMT (as described in 2 below). In this program, mountainous areas such as the northern region, where shifting cultivation is being practiced, should be considered to help stabilize it as well as to secure food production.

- 2) Supporting of Irrigation Management Transfer (IMT) (Technical Assistance; TA)

At present, there is no detailed database of the country's irrigation activities. Therefore this TA is recommended as an IMT supporting program to collect specific information and recommendations. The TA will cover the construction of an irrigation database including natural and human resources conditions, constraints, and requirements to improve agricultural production, irrigation area sizes, facility condition, farmers' organization activities, rehabilitation needs and other necessary information. Within this TA, prioritization of irrigation development covering the whole country will be made so that the IMT process can be implemented step by step.

- 3) Best irrigation use of exploited water resources with the promotion of Diversified Agriculture

This program deals with the construction of medium and large-scale irrigation schemes at potential areas to maintain self-sufficiency as well as to encourage

crop diversification, thereby increasing overall agricultural production by the effective use of water exploited by other sectors such as large-scale hydro-power development. Through reconnaissance by MAF, PAFS and with a series of assistance from international donors, the potential area in the country has been assessed. The Government of Vietnam, for instance, has completed a study on water resources development planning in the major plains along the Mekong River under the technical cooperation program over the period 1997 to 2000. According to this study, approximately 400,000 ha in seven major plains, which comprise both paddy and upland fields, are proposed for irrigation by 2010s. Therefore, some of these potential areas should be considered under this program.

#### 4) Groundwater Irrigation Development

This program is to introduce and promote particularly high-valued crops by adopting groundwater as a supplemental irrigation water supply. The program comprises investigation of the groundwater potential, construction of pilot groundwater irrigation schemes with introduction of high-valued crops, and the extension of groundwater irrigation schemes linked to rural development programs.

#### 5) Flood Disaster Mitigation Program

The purpose of this project/program is to secure agricultural production and properties in flood-prone areas along tributaries of the Mekong River. The program would assess damage to flood-prone areas, selection of priority areas, planning, designing and construction of flood protection facilities.

### (3) Implementation Process

In total, 11 projects are listed in the irrigation sub-sector under the strategies mentioned above. The implementation plan is basically divided into three phases; short, medium and long term.

In the short term, the projects/programs, which should commence or continue are: on-going small-scale irrigation rehabilitation and construction schemes, such as CMISP, DIDMP and ADP. These should continue and be expanded in order to recover and upgrade the facilities with institutional strengthening through the IMT process. In parallel, TA should be conducted on the strategic implementation of the IMT process covering the whole country. Also, a program for flood disaster mitigation will be implemented, since the tributaries of the Mekong River around

Vientiane and in the central-southern provinces cause serious damage every wet season.

In the medium term, some of the on-going projects for rehabilitation and construction of small-scale irrigation schemes should continue. In addition, Community Managed Small Scale Irrigation Project utilizing the IMT process should be fully implemented from this phase based on the information, recommendations and prioritization prepared by the TA on IMT process. This program will continue systematically to 2020 since the target area is the whole country.

Self-sufficiency and crop diversification should be achieved in the middle term partially through the activities mentioned above. The long-term strategy includes more active promotion of crop diversification and high-valued crops. These initiatives should be boosted in high potential areas through the construction of medium and large-scale irrigation schemes and the introduction of ground water irrigation.

However the future situation for the agriculture sector in Lao PDR and neighboring countries might change, thus this proposed Action Plan and its implementation schedule should be periodically reviewed.

#### (4) Expected Results

The following results are expected through the implementation of the proposed projects/programs in this sub-sector.

- 1) Food self-sufficiency will be maintained.
- 2) Irrigation schemes covering approximately 100,000 ha will be recovered and well operated under IMT by year 2020.
- 3) Farmers' income will increase, particularly for those staying in remote rural areas, by farming diversification.
- 4) Shifting cultivation will be stabilized with the help of irrigation initiatives.

## CHAPTER 7 ACTION PLAN FOR INTEGRATED AGRICULTURAL DEVELOPMENT

### 7.1 Action Plan towards the Year 2020 for Integrated Agriculture Development

An Action Plan towards the Year 2020 for Integrated Agriculture Development has been formulated for 10 sub-sectors, namely: i) Land and Water Resource Development; ii) Institutions and Organizations; iii) Human Resource Development; iv) Field Crops; v) Livestock and Fisheries; vi) Stabilization of Shifting Cultivation; vii) Marketing and Agro-processing; viii) Rural Finance; ix) Rural Development; and x) Irrigation. The Action Plan consists of several components within each sub-sector and is shown in the following pages. Constraints & potentials, objectives, required action, targets & goals, responsible agencies and proposed projects are elaborated. For the formulation of the proposed projects, the constraints and potentials of components are assessed and their objectives are set out. Based on this assessment, required actions and target/goals are then proposed. Finally the proposed projects to be implemented are identified, specifying the actions required and methods to achieve the targets/goals.

In total, 110 projects have been identified and detailed information including the project title, executing agencies, phasing, location, objectives and components are given in Attachment 2 “List of Proposed Programs and Projects”. The number of projects proposed for each sub-sector is shown below:

**Table 7.1 Summary of Proposed Programs and Projects**

Sub-Sector	Nos. of Programs and Project
1. Land and Water Resource Development	9
2. Institution and Organization	13
3. Human Resource Development	7
4. Field Crops	22
5. Livestock and Fisheries	12
6. Stabilization of Shifting Cultivation	9
7. Marketing and Agro-processing	9
8. Rural Finance	13
9. Rural Development	5
10. Irrigation	11
<b>Total</b>	<b>110</b>

Note: 110 programs/projects include 9 sub-programs/sub-projects.

## 1. Land and Water Resource Development

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1. Development of clear and enforceable land use ownership rights</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>Lack of long-term national plan for Land Use planning and Land Allocation in rural area.</li> <li>Lack of funds for implementing LUP &amp; LA.</li> </ul>	<ul style="list-style-type: none"> <li>To implement participatory LUP&amp;LA.</li> <li>To stabilize shifting cultivation</li> <li>To secure livelihood of villagers in allocated lands.</li> </ul>	<ul style="list-style-type: none"> <li>Expansion of LUP&amp;LA methodologies which are field tested.</li> <li>Review the past LUP&amp;LA activities and follow-up, if necessary .</li> </ul>
<b>2. Water Resource Management</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>Water-related conflicts among various sectors (e.g. irrigation, hydropower, and fishery)</li> <li>Serious damage by flooding to agricultural product and properties</li> <li>Soil erosion in specific areas</li> <li>Low agricultural productivity due to water scarcity in some areas</li> </ul> <p>&lt;Potential&gt;</p> <ul style="list-style-type: none"> <li>Water source is abundant.</li> </ul>	<ul style="list-style-type: none"> <li>Implement proper water resource management from an economic and environment viewpoint</li> </ul>	<ul style="list-style-type: none"> <li>Establish optimum water use among the concerned organizations</li> <li>Establish an environmentally sustainable water resources development plan</li> <li>Strengthen the water resources coordination committee established by concerned organizations</li> <li>Establish procedures for integrated watershed management</li> </ul>
<b>3. Land Resource Management</b>	<p>&lt;Constraints &gt;</p> <ul style="list-style-type: none"> <li>Decreasing forest cover, increasing soil erosion through unsustainable shifting cultivation</li> <li>Serious damage by flooding to agricultural product and properties</li> </ul>	<ul style="list-style-type: none"> <li>Implement proper land resource management for sustainable agriculture</li> </ul>	<ul style="list-style-type: none"> <li>Establish land resources database and mapping</li> <li>Consolidate all natural resource planning and management functions at the national level</li> <li>Strengthen natural resources management systems at the national and village/community level</li> <li>Develop agro-zoning classification maps</li> <li>Detail assessment of flood damaged area</li> <li>Rehabilitation and upgrading of flood protection facilities</li> </ul>
<b>4. Land and Water Resource Research Program</b>	<p>&lt;Constraints &gt;</p> <ul style="list-style-type: none"> <li>Low agricultural productivity due to the lack of research for developing technical know-how and providing basic data &amp; information</li> </ul>	<ul style="list-style-type: none"> <li>Enhance agriculture productivity and sustainability through appropriate technology using natural resources</li> </ul>	<ul style="list-style-type: none"> <li>Review existing data on completed and on-going projects</li> <li>Develop technical supporting systems</li> <li>Research activities through effective participatory approach by farmers</li> <li>Technical training for staff through on-the-job and in-country research courses</li> </ul>
<b>5. Upgrading the Meteo-hydrological Observatory System</b>	<p>&lt;Constraints &gt;</p> <ul style="list-style-type: none"> <li>Damage to Agricultural products through natural disasters due to lack of weather information</li> </ul>	<ul style="list-style-type: none"> <li>Enhance an agro-meteorological observatory system to conduct effective observations for providing the necessary data to secure agricultural production and mitigate natural disasters</li> </ul>	<ul style="list-style-type: none"> <li>Rehabilitation and upgrading of meteo-hydrological observatory facilities</li> <li>Provide an educational upgrading program for DMH and the provincial meteo-hydrology offices</li> </ul>
<b>6. Land-use Planning and Management based on land - suitability and community identified needs</b> (Relevant for Shifting Cultivation areas inside and outside National Biodiversity Conservation Areas – NBCAs)	<ul style="list-style-type: none"> <li>Planning systems for Districts currently based on district, provincial &amp; centrally determined requirements.</li> <li>Lack of guidelines and land classification system based on land capability / suitability.</li> <li>Lack of soil information, soils testing &amp; analysis laboratories, services &amp; procedures.</li> <li>Limited provincial capabilities in natural resource planning and management.</li> </ul>	<ul style="list-style-type: none"> <li>Establish sustainable land use on the basis of people's consensus and proper natural resource management</li> </ul>	<ul style="list-style-type: none"> <li>Development of national land classification system and land-use planning procedures.</li> <li>To establish, equip and staff Regional Soil Testing Laboratories and services.</li> <li>To develop provincial &amp; district capability in natural resource planning and management.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs								
		Code	Title	Possible Donor Source						
<ul style="list-style-type: none"> <li>Registration of land use rights of long term occupants is accelerated</li> <li>Villagers ownership over land is strengthened</li> </ul>	National Program for stabilization of Shifting Cultivation, DOF NAFES	LW-1	Strengthening Land Use Planning (LUP) & Land Allocation (LA) and Land Titling in Rural Area	International Organizations Bilateral						
<ul style="list-style-type: none"> <li>Establish optimal water use plans from the viewpoints of water policy, the economy and the environment</li> <li>Establish environmentally sustainable watershed management systems</li> </ul>	NAFRI STEA	LW-2 LW-3	TA on Nationwide Shared Water Resources Management Watershed Management Program	International Organizations Bilateral						
<ul style="list-style-type: none"> <li>Sustainable land use for agriculture and forestry is implemented</li> <li>Appropriate area-based agricultural classification based on physical, economic and competing land use systems are established</li> <li>Agricultural production and properties in flood-prone areas along Mekong river are secured</li> </ul> <p>Reference: Target Forest Coverage</p> <table> <tr> <td>At present</td> <td>45 %</td> </tr> <tr> <td>2010</td> <td>55 %</td> </tr> <tr> <td>2020</td> <td>60%</td> </tr> </table>	At present	45 %	2010	55 %	2020	60%	NAFRI	LW-4 LW-8 IR-11	Agro-zone Classification, Land Management and Farming Systems Development Support to STEA for Environment-Friendly Agriculture Development Flood Disaster Mitigation	International Organizations Bilateral
At present	45 %									
2010	55 %									
2020	60%									
<ul style="list-style-type: none"> <li>Soil conservation technology for the sustainable land use is developed</li> <li>Appropriate technology for irrigation water management is developed</li> </ul>	NAFRI	LW-5 LW-6	Soil and Water Conservation Technology Research Program Irrigation Water Management Research Program	International Organizations Bilateral						
<ul style="list-style-type: none"> <li>Timely and accurate meteo-hydro data is provided for agriculture production through;</li> <li>Measuring and recording</li> <li>Analyzing data/information</li> <li>Forecasting</li> </ul>	DMH/MAF	LW-7 LW-9	Rehabilitation and Expansion of Meteo-hydrology Stations for Agriculture Development and Flood Control Strengthening of Weather Forecast System for Agriculture Activities and Disaster Operation	International Organizations Bilateral						
<ul style="list-style-type: none"> <li>Land-use classification system &amp; planning procedures is completed based on soils, slope, erosion risk and other criteria.</li> <li>Natural resources inventory planning and management is made by province/district themselves.</li> </ul>	NAFRI MAF/DoF	LW -4	Agro-zone Classification Development, Land Management & Farming Systems Information Extension	Bilateral						



## 2. Institutions and Organizations

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1. Institutional strengthening/ Capacity Building of MAF</b>	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>The number of staff at the central level is limited.</li> <li>Limited incentive &amp; low salary .</li> <li>The policies and human resource of MAF depend on external assistance.</li> <li>Low capacity in technical, management, planning and statistics fields.</li> <li>No clear job description for institutions and staff.</li> <li>There is a bias toward capital investment. (Budget limitation for increasing staff.)</li> <li>There is a limitation in capacity for crop diversification, agribusiness, and marketing. (Staff with limited field experience in some institutions.)</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>MAF staff are basically well educated and competent.</li> <li>Potential manpower with 60% under 35 year of age.</li> </ul>	<ul style="list-style-type: none"> <li>To strengthen the capacity of MAF with regard to planning, research coordination, aid co-ordination and implementation.</li> <li>To encourage MAF to respond to farmers ' diversified needs in an evolving market economy.</li> </ul>	<ul style="list-style-type: none"> <li>Institutional strengthening of DOP, NAFES, and NAFRI.</li> <li>Improve research and extension coordination with other countries .</li> <li>Improve the Management System within each department and agency .</li> <li>Improve Planning and Statistics (in relation to strengthening DOP).</li> <li>Elaborate proper job description, career development system, and coordination of in-service training for all departments .</li> </ul>
<b>2. Strengthening and Capacity building of Provincial and District Agriculture and Forestry Institutions</b>	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>The number of and capacity in the technical and management fields of staff at the provincial and district level is limited.</li> <li>Capacity in management planning and statistics is limited.</li> <li>Low capacity of Subject Matter Specialist (SMS) at the Provincial level.</li> <li>Staff allocation among provinces and districts are not balanced.</li> <li>Lack of incentive and low salary .</li> <li>No extension workers at district level and no clear job description.</li> <li>Under staffed; most staff are concentrated in offices .</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>GOL is proceeding with decentralization.</li> </ul>	<ul style="list-style-type: none"> <li>To strengthen the capacity of provincial and district staff with regard to project planning, implementation, and monitoring &amp; evaluation as well as technical and management fields.</li> <li>To encourage provincial and district staff to respond to farmers ' diversified needs in the evolving market economy.</li> </ul>	<ul style="list-style-type: none"> <li>Enhance management and technical capacity.</li> <li>Strengthen agricultural and rural development planning capacity including agriculture statistics and information/data.</li> <li>Securing the budget for local government 's recurrent costs.</li> <li>Develop proper incentive systems.</li> </ul>
<b>3. Improvement and revision of agricultural related legislation</b>	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>Rigid regulation system is hampering agriculture development.</li> <li>Lack support for private investment and for privatization.</li> <li>Basic services such as transportation, communication and support for new businesses are generally lacking.</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>GOL is showing a clear commitment to market-friendly economy for agriculture development.</li> </ul>	<ul style="list-style-type: none"> <li>To build sound basis for sustainable agriculture development.</li> <li>To offer a level playing field for private sector by clarifying agriculture-related laws and regulations.</li> </ul>	<ul style="list-style-type: none"> <li>Establish new laws/regulations and revision of existing laws/regulations which promote environmentally sustainable agriculture development.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
<ul style="list-style-type: none"> <li>• Program/project planning and implementation capacity of MAF is strengthened.</li> <li>• Capital and recurrent expenditures are balanced.</li> <li>• Management, planning, statistics, and personnel management systems are improved with improved career development.</li> <li>• TNA (Training Needs Assessment) in all departments.</li> <li>• In-service training program is elaborated including short-term plans (Management Training).</li> <li>• Long-term training at NUOL is specified for up-grading staff.</li> <li>• Long term training overseas (AIT, Japan, Australia, Europe, ASIAN countries, etc.) specified for up-grading staff.</li> </ul>	MAF NAFRI NAFES	IO-1.1 IO-1.2 IO-1.3 IO-2 IO-4 IO-4.1 IO-4.2 IO-4.3 IO-5 IO-9	Strengthening Administration and Management Procedures of MAF Strengthening Planning and Statistical Capacity of MAF Strengthening Human Resource Management of MAF Consolidation of Management and Planning Capacity of MAF Institutions NAFRI Strengthening Program NAFRI Institutional Strengthening and Restructuring Project NAFRI Staff Capacity Building Project NAFRI Research Upgrading Project ASEAN Countries Research Coordination Development of MAF's and Local Governments New Roles in the Market-driven Economy (T/A)	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>• Program/project planning and implementation capacity of PAFS &amp; DAFS strengthened.</li> <li>• PAFS &amp; DAFS management, statistics, and personnel management systems are improved with improved career development.</li> <li>• TNA of all PAFS &amp; DAFS.</li> <li>• In-service training program is elaborated including short-term plan (Management Training).</li> <li>• Long-term training at NUOL is specified for up-grading staff.</li> </ul>	MAF/ Provincial Office/ District Office, PAFSs & DAFOs  DOI/MAF  DOI/MAF Province	HR-2 IO-3 IO-3	Development of District In-service Training and Farmer Training in Agriculture and Forestry (Phase-1) Development of District In-service Training and Farmer Training in Agriculture and Forestry (Phase-2) Study Tour Program for Local Decision-makers	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>• Agriculture-related laws and regulations are streamlined and this contributes to agriculture and rural development nationwide.</li> </ul>	MAF MJ MCT Bank of Lao PDR	IO-6 IO-7 IO-8 MR-1 MR-4 AC-20 LF-4 MR-5	Plant Quarantine Strengthening Project Legislation for Agro-chemicals Seed import Regulations and Seed Registration & Certification System Food Hygiene Inspection System (Ref. 2. Marketing) Agricultural Products Grade and Classification Project (Ref. 7. Marketing) Agriculture Machinery Performance Test Systems Criteria (Ref. 4. Crops) Introduction of Animal Insurance System (Ref. 5. Livestock & Fishery) The regulatory framework based on a market friendly and commercial approach (T/A) (Ref. 7. Marketing)	International Organizations  Bilateral

### 3. Human Resource Development (1/2)

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1 .Establish-ment of Integrated Extension and Training System</b>	<ul style="list-style-type: none"> <li>• No clear vision and mission defined for the National Agriculture and Forestry Extension Services (NAFES) and the Agriculture and Forestry Training Centers.</li> <li>• The extension component focusing on sloping areas is not developed.</li> <li>• Technical departments , through donor assistance projects , do their own extension and farmer training. (Lack of coordination)</li> <li>• Training of farmers is done on add hoc basis .</li> <li>• Lack of qualified trainers .</li> <li>• Lack of progressive training courses .</li> <li>• NAFES and AFETC premises and facilities are underutilized.</li> </ul>	<ul style="list-style-type: none"> <li>• To develop an integrated extension system.</li> <li>• To strengthen the capacity of Extension Institutions (NAFES, AFETC, DAFO) in providing integrated extension to farmers.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop an integrated extension system and up-grade the capacity of NAFES in extension.</li> <li>• Develop Agriculture and Forestry Extension Training component for the sloping land areas.</li> <li>• Develop of AFETC for flat land and for the Boloven area (under NAFES).</li> <li>• Introduce farmer vocational training in AFETC.</li> <li>• Develop farmer’s vocational training schools (linked with AFETC activities.)</li> <li>• Develop a curriculum and syllabus for farmer training.</li> <li>• Develop the teaching capacity at vocational training schools.</li> <li>• Establish a “farmer link” between agriculture and forestry research, extension, and education/training under NAFES.</li> <li>• Reorient the training centers to agriculture and forestry extension centers .</li> <li>• Establish extension and training for farmers in up-land and low land areas .</li> </ul>
<b>2. Capacity Building of Village Authority and Farmer Organizations</b>	<ul style="list-style-type: none"> <li>• Farmers receive little if any support from the government and the private sector.</li> <li>• Subsistence agriculture is still practiced in many up-land areas.</li> <li>• Farmers are practicing slash and burn cultivation.</li> <li>• Limited knowledge in community leadership and management (including bottom-up planning)</li> <li>• Limited knowledge about improved agriculture production, resource conservation, and commodity production.</li> <li>• There is high dependency on the government among villagers.</li> <li>• Farmer’s formal groups are weak and lacking in management and technical skills .</li> <li>• There are no farmer institutions .</li> </ul>	<ul style="list-style-type: none"> <li>• To develop focal areas for agriculture, forestry and rural development.</li> <li>• To build up the capacity of village authorities and community organizations .</li> <li>• To build up the capacity of farmer’s organization to manage and develop agricultural and forestry activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Enhance the capacity of village authorities and communal organizations in planning and implementation of development projects based on past experiences.</li> <li>• Development and strengthening of a farmer’s organization in management, technical knowledge and skills (including WUO, farmer’s production groups, credit cooperatives, APB credit groups, village cottage industry groups, village buying and selling cooperatives).</li> <li>• Enhance the knowledge of the farmer organization and members in community leadership and management.</li> <li>• Develop training programs for village and communal organizations based on a training need assessment and on specific village development matrix.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
<ul style="list-style-type: none"> <li>• NAFES strengthened to provide integrated extension service in agriculture &amp; forestry.</li> <li>• Integrated extension service developed under NAFES, AFETC, and DAFO.</li> <li>• FSEW training process elaborated and applied.</li> <li>• Farmer training process elaborated and applied.</li> <li>• 4 AFTC/FVS strengthened and developed to serve up-land agriculture and forestry development (Houaphan, Xieng Ngeun, Hinheup, and Xepon)</li> <li>• 5 AFTC/FVS developed to serve flat land agriculture and forestry (Nam Tha, Nam Tan, Paksan, Nakae, Saravane)</li> <li>• 1 AFTC/FVS developed to serve the Boloven area (Paksong Km 21)</li> <li>• 6 FVS developed in provinces without AFETC (Phongsaly, Bokeo, Xiengkhouang, Khammouane, Attapeu, Xekong)</li> <li>• Extension tools and materials for NAFES and AFETC including TV and radio programs developed.</li> <li>• Curricula, syllabi, textbooks, lecture notes and trainer capacity building developed for FSEW and farmer training of the AFETC/FVS.</li> </ul>	MAF/DOP, Dept of Personnel, DOA, NAFES, AFETC/FVS	HR-1 HR-2 HR-3	Strengthening Agriculture and Forestry Extension Services Development of District In-service Training and Farmer Training in Agriculture and Forestry (Phase 1) Development of District In-service Training and Farmer Training in Agriculture and Forestry (Phase 2)	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>• District focal areas selected under the PRONAM approach.</li> <li>• Improved village and community management and planning.</li> <li>• Farmer's organization strengthened.</li> <li>• Training program for village organization developed.</li> <li>• Training program for farmer's organization developed.</li> </ul>	PAFS and DAFO of all provinces, NAFES	(included in above projects) (Ref. 9. Rural Development)		International Organizations  Bilateral

### 3. Human Resource Development (2/2)

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>3. Strengthen the Capacity of Technical Education in Agriculture and Forestry</b>	<ul style="list-style-type: none"> <li>• No clear vision and mission defined for the AFT schools.</li> <li>• Objective is to provide in-service training for MAF but have to accept additional student from the ministry of education.</li> <li>• Over sized intake of student.</li> <li>• Limited teaching capacity.</li> <li>• Lack of practical curriculum, field practice, teaching aids, qualified teachers/trainers , and school facilities and equipment.</li> <li>• Graduates have low quality education.</li> </ul>	<ul style="list-style-type: none"> <li>• To improve the quality of agriculture and forestry technician education.</li> <li>• To develop formal training and education in agriculture and forestry for future FSEW and technicians.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop Agriculture and Forestry Technician Training Institution and Agriculture and Forestry Technician Training Curricula and Syllabi, including Technician Schools under the Ministry of Education.</li> <li>• Teaching Capacity Building of Agriculture and Forestry Technician Training.</li> <li>• Improvement of school facilities and equipment especially for field practice.</li> </ul>
<b>4. Strengthen the Capacity of University Education in Agriculture and Forestry</b>	<ul style="list-style-type: none"> <li>• Low quality of university education and over sized intake of students .</li> <li>• Limited teaching capacity.</li> <li>• Inadequate curricula and syllabi.</li> <li>• Lack of field practice, teaching aids, qualified teachers/trainers, facilities and equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• To improve the quality of agriculture and forestry university education.</li> <li>• To develop formal training and education in agriculture and forestry for future SMS and superior technicians .</li> </ul>	<ul style="list-style-type: none"> <li>• Agriculture and Forestry University Training Curricula Development.</li> <li>• University Teaching Capacity enhanced in Agriculture and Forestry</li> <li>• Strengthening the Faculties of Agriculture and Forestry .</li> <li>• Strengthening the Department of Irrigation Engineering in the Faculty of Engineering and Architecture.</li> </ul>
<b>5. Develop Environment Awareness and Agriculture Knowledge in Primary Secondary and Education</b>	<ul style="list-style-type: none"> <li>• Limited environmental awareness among children especially in up-land areas.</li> <li>• In rural areas children are helping their family in agriculture production including animal husbandry. Basic knowledge in crops and animal raising could be introduced in the existing primary and secondary schools curriculum and syllabus.</li> <li>• Role of women in NRM is not fully recognized.</li> <li>• Gender-gaps in school enrollment.</li> </ul>	<ul style="list-style-type: none"> <li>• To improve agriculture and environmental education in primary and secondary schools, particularly in rural schools.</li> <li>• Improve girl's access to basic education.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop children's awareness of environmental protection by introducing environmental education in primary and secondary school, and in agriculture development by improving the existing curricula and teaching capacity in agricultural and forestry subjects.</li> <li>• Development of schools tree nurseries, tree planting and schools farms.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
<ul style="list-style-type: none"> <li>• Curricula and teaching capacity of the 3 AFTS strengthened (Pak Xueng, Muong Mai, Pakse).</li> <li>• Curricula and teaching capacity of Tha Ngon Irrigation Training Institute strengthened.</li> <li>• Curricula and teaching capacity of the Ministry of Education Technique Schools Improved (Phonmi TS, Dongkhanxang TS)</li> </ul>	MAF/Dept. of Personnel, DOI, AFTS  Min. of Education	HR-4 HR-5	Strengthening Agriculture and Technical Education Capacity Irrigation Technician School Improvement	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>• Curricula and teaching capacity of the Faculties of Agriculture, Forestry, and the Department of Irrigation Engineering Improved.</li> </ul>	Min. of Education	HR-6	Program for Strengthening the Capacity of University Education in Agriculture and Forestry	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>• Curricula and syllabi and teaching capacity in environment and agriculture education developed.</li> <li>• Textbooks, school tree nurseries, and school farm are developed.</li> <li>• Greater gender equity</li> </ul>	Min. of Education	HR-7	Agriculture and Forestry Education in Primary and Secondary Schools Development	International Organizations  Bilateral

#### 4. Crops: Research, Extension, and Related Activities (1/2)

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1. Food Production Program</b>	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>• The number of farmers using improved seeds is limited.</li> <li>• Little on-farm knowledge of improved technology due to absence of extension service.</li> <li>• Post-harvest loss and quality deterioration of rice.</li> <li>• Flood and inundation damage during wet season in low land areas.</li> <li>• Insufficient irrigation water management at the farm level.</li> <li>• Insufficient distribution of credit and fertilizers, especially in the remote area.</li> <li>• Poor access road for purchasing inputs and selling products.</li> <li>• Lack of technology for cultivation of upland rice and other food crops.</li> <li>• Lower productivity of upland rice in shifting cultivation, deterioration of forest environment.</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>• Improved variety of rice has been developed by Lao-IRRI project.</li> <li>• Further expansion of lowland paddy is possible for about another 1.0m ha.</li> <li>• Alternatives to shifting cultivation developed.</li> </ul>	<ul style="list-style-type: none"> <li>• To ensure national food sufficiency</li> <li>• Minimum Target Production of Paddy for Food Security (Draft and target for 2001-2005)</li> <li>• 2005: 2.26 m. t.</li> <li>• 2010: 2.52 m. t.</li> <li>• 2020: 2.93 m. t.</li> <li>• To equilibrate rice shortage and surplus between provinces.</li> <li>• To increase food production in mountainous remote area.</li> </ul>	<ul style="list-style-type: none"> <li>• Improve rice multiplication system including foundation seeds production.</li> <li>• Establish and strengthen the integrated and participatory agriculture extension system including adaptive research trial and demonstration.</li> <li>• Improve extension guideline and materials.</li> <li>• Facilitate post-harvest in rice milling storage in the private sector.</li> <li>• Technology improvement of irrigation water management.</li> <li>• Further develop applicable technology for rice varieties and cultivation.</li> <li>• Improve rural access roads.</li> <li>• Improve access to rural credit for purchasing inputs.</li> <li>• Develop proper and area-specific technology for production of upland rice and other food crops.</li> </ul>
<b>2. Commercial Crop Production Program</b>  (to be continued)	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>• Insufficient quality control and lack of grading and classification system for commercial crop production.</li> <li>• Non-availability of improved varieties/hybrid seeds.</li> <li>• Little on-farm knowledge of improved technology due to absence of extension service.</li> <li>• Insufficient irrigation water management at the farm level.</li> <li>• Insufficient distribution of credit and fertilizer, especially in the remote area.</li> <li>• Poor access road for purchasing inputs and selling products.</li> <li>• Limited market channels and market information.</li> <li>• Limited or insufficient post harvest and agro-processing facilities for commercial crops.</li> <li>• Limited information on suitable crops to be introduced based on area-specific natural conditions.</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>• Natural conditions (soil &amp; climate) allow cultivating various commercial crops under rainfed condition.</li> <li>• The private sector investment to agro-processing and marketing activities have been increasing gradually .</li> </ul>	<ul style="list-style-type: none"> <li>• To diversify cultivation crops.</li> <li>• To enhance farm income through crop diversification and introduction of cash crops.</li> </ul>	<ul style="list-style-type: none"> <li>• Quality improvement of commercial crop products by establishing grading and classification systems with a testing laboratory .</li> <li>• Implement research on a selection of improved varieties for commercial crops.</li> <li>• Develop area-based applicable technology for commercial crop production.</li> <li>• Develop proper agro-zoning to introduce new crops.</li> <li>• Revision of regulations/laws related to imports and registration of seeds/seedlings for commercial crops.</li> <li>• Strengthen the integrated and participatory agricultural extension system including adaptive research trial and demonstration.</li> <li>• Improve extension guideline and materials.</li> <li>• Improve irrigation water management.</li> <li>• Facilitate agro-processing activities by individual farmers or farmers ' group.</li> <li>• Establish market information systems for farmers.</li> <li>• Improve access roads to markets.</li> <li>• Improve access to rural credit for purchasing inputs.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
<ul style="list-style-type: none"> <li>• Production and distribution of improved seed are increased.</li> <li>• Improved farming technology is efficiently provided to farmers.</li> <li>• The irrigation effect and the irrigated area are maximized.</li> <li>• Qualified milled rice with minimum loss will be produced.</li> <li>• Unit yield of rice is increased and stabilized.</li> <li>• Farm to market roads are improved.</li> <li>• Access to credit is improved in rural area.</li> <li>• Upland rice cultivation areas and yields are stabilized.</li> </ul>	MAF NAFRI NAFES RDO	AC-1 AC-2 AC-3 Ref.	Rice Seed Multiplication Systems Improvement Project Rice Storage for Emergency Purpose Integrated Upland Agricultural Research Project (IUARP) 2. Institutions & Organizations and 3. Human development with regard to extension service strengthening. 1. Land and Water Resource Development with regard to upland cultivation. 8. Rural Finance and 9. Rural Development for access improvement in rural area.	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>• High quality commercial crop production, cultivate area, yield are increased.</li> <li>• Grading and standardization system is established.</li> <li>• Value-added of products are increased.</li> <li>• Improved technology is provided to farmers effectively.</li> <li>• Sustainable agriculture is expanded through proper land use and cropping pattern.</li> <li>• Irrigation effect and the irrigated area are maximized.</li> <li>• Regulation on domestic and international trade, seed certification and registration system are established.</li> <li>• Market information system is established.</li> <li>• Farm to market roads are improved.</li> <li>• Access to credit is improved.</li> </ul>	MAF, DOA, DOF NAFRI NAFES	AC-4 AC-5 AC-6 AC-7 AC-8 AC-9 AC-10 AC-11 AC-12 AC-13 AC-14 AC-15 AC-16 AC-17 AC-18 AC-21	Crop Diversification Program Outer City Horticulture Promotion Program Sustainable Sugarcane Production Promotion Program Exported Oriented Crop Promotion Program Fruits Crop Promotion Program in Northern Region Fruits Crop Promotion Program in Southern Region Sericulture Development Project Private Sector Assistance Project for Silk Production (Large Scale) Farming Technology Dissemination Project Contract Farming in Intensive Areas (to be combined with AEA extension program) Coffee Cultivation Technology Research Program Vegetable Cultivation Technology Research Program Fruits Cultivation Technology Research Program Integrated Farming Technology Research Program Lao-IRRI Rice Research and Training Project (LIR RTP) Phase 4 Basic Seeds Production Technology Development Project	International Organizations  Bilateral



#### 4. Crops: Research, Extension, and Related Activities (2/2)

Major Sub-Component	Constraints and Potentials	Objective	Required Action
(continuation) <b>2. Commercial Crop Production Program</b>	<ul style="list-style-type: none"> <li>• Further expansion of cultivated area of crops under irrigated land is possible.</li> <li>• It is widely observed that many farmers are becoming market oriented as the market economy is infiltrating to the rural population</li> </ul>		
<b>3. Integrated Agriculture Development Program</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• Lack of technical knowledge by farmers for introducing or expanding integrated agriculture due to non-functional extension service.</li> <li>• There is no good examples of successful integrated agriculture in surrounding areas.</li> <li>• Poor access road for purchasing inputs and selling products.</li> <li>• Limited market channels and market information.</li> <li>• Shortage of manpower to maintain fields in rural area.</li> </ul> <p>&lt;Potential&gt;</p> <ul style="list-style-type: none"> <li>• Natural conditions (soil &amp; climate) allow cultivating various commercial crops as well as livestock and fisheries.</li> <li>• It is widely observed that many farmers are becoming market-oriented as the market economy is infiltrating into rural areas.</li> </ul>	<ul style="list-style-type: none"> <li>• To enhance and stabilize farm income through the introduction or expansion of integrated agriculture combining crops, livestock and inland fishery.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop area-based proper technology for integrated agriculture.</li> <li>• Establish and strengthen the integrated and participatory agriculture extension system including adaptive research trial and demonstration.</li> <li>• Improve extension guideline and materials.</li> <li>• Facilitate post-harvest and agro-processing activities by individual farmers and farmer groups.</li> <li>• Improve access road to markets.</li> <li>• Improve access to rural credit for purchasing inputs and materials.</li> <li>• Develop mechanized farming systems.</li> <li>• Establish a performance test system for agriculture machinery</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
		MR-4	Agricultural Products Grade and Classification Project	
		LW-4	Agro-Zone Classification, Land Management and Farming System Information	
		There is a strong linkage with other relevant sectors such as 8. Marketing and 9. Rural Development.		
<ul style="list-style-type: none"> <li>• Number of farm households practicing integrated agriculture is increasing.</li> <li>• Livelihood is improved by the introduction of integrated agriculture.</li> <li>• Farmers have access to proper extension services for integrated agriculture.</li> <li>• Value-added of agriculture products is increased.</li> <li>• Farm to market roads are improved.</li> <li>• Overall agriculture activities are intensified.</li> <li>• Performance test system for agriculture machinery is set up.</li> </ul>	MOA MLF NAFRI NAFES	AC-17	Integrated Farming Technology Research Program	International Organizations
		AC-18	Lao-IRRI Rice Research and Training Project (LIR RTP) Phase 4	Bilateral
		AC-19	Mechanized Farming System Research Program	
		AC-20	Agriculture Machinery Performance Test Criteria	
		AC-21	Basic Seed Production Technology Development Project	
		AC-22	Upland Crop Cultivation Technology Research Program	
		There is a strong linkage with other relevant sectors such as 8. Rural Finance, 3. Human Resource Development, and 9. Rural Development.		

## 5. Livestock and Fisheries

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1. Livestock Development</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• General lack of adequate handling and feeding techniques for livestock.</li> <li>• Frequent loss of animals due to disease.</li> <li>• Non-availability of improved breeds due to insufficient technology improvement.</li> <li>• Extension service is not functioning.</li> <li>• Insufficient veterinary education and certificate system.</li> <li>• Lack of access to credit for livestock production especially in remote area.</li> <li>• Poor access road for purchasing inputs and selling products.</li> <li>• Lack of information network on productivity, diseases and markets.</li> <li>• Future shortage of feed is a concern.</li> </ul> <p>&lt;Potential&gt;</p> <ul style="list-style-type: none"> <li>• Livestock sector accounts for 39% of the agriculture GDP.</li> <li>• Livestock exports have started to improve.</li> <li>• More and more villagers are interested in increasing cattle numbers.</li> </ul>	<ul style="list-style-type: none"> <li>• To achieve sustainable development in the livestock sector in an environmentally friendly manner.</li> <li>• To reduce the loss of livestock.</li> <li>• To increase in income at the household level through livestock production.</li> <li>• To contribute to the nutritional improvement through increased protein supply.</li> <li>• To enhance foreign exchange earnings through export.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop suitable technology for overall improvement in livestock production.;</li> <li>• -Improved breeds.</li> <li>• -Fodder crop production.</li> <li>• -Feed development using locally available material.</li> <li>• -Sustainable use of pastureland.</li> <li>• Strengthen animal health control system through the production and distribution of vaccines.</li> <li>• Strengthen the livestock extension system by adaptive research trials and demonstration.</li> <li>• Rehabilitate the existing research center and stations.</li> <li>• Strengthen information network system on productivity, disease and markets.</li> <li>• Introduce a meat inspection system with the installation of facilities.</li> <li>• Establish an inspection system for livestock breeding with the installation of necessary facilities.</li> <li>• Technical assistance for animal improvement and breeding for the private sector.</li> <li>• Improve access roads and access to credit for livestock production.</li> <li>• Introduce a veterinary education and certificate system.</li> </ul>
<b>2. Fishery Development</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• Insufficient supply of improved varieties of fish fry.</li> <li>• Extension service is virtually absent.</li> <li>• Technology improvement is insufficient for fry production.</li> <li>• Lack of access to credit for fish production especially in remote area.</li> <li>• Poor access roads for purchasing inputs and selling products.</li> <li>• Information on markets are not available.</li> <li>• Shortage of fish feed.</li> </ul> <p>&lt;Potential&gt;</p> <ul style="list-style-type: none"> <li>• The returns from fish culture are much higher than paddy cultivation.</li> <li>• More and more farmers are showing interests in fish production even in remote area.</li> <li>• The domestic demand for fish is increasing.</li> <li>• Underutilized water bodies are available and stress to the environment is limited.</li> </ul>	<ul style="list-style-type: none"> <li>• To achieve sustainable fishery development in an environmentally friendly manner.</li> <li>• To increase income at the household level through fish production.</li> <li>• To contribute to the nutritional improvement through increased protein supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Development of applicable technology for inland fishery production including pond management and feeding.</li> <li>• Development of technology on fish feed using materials that are locally available.</li> <li>• Establishment and strengthening the integrated and participatory agriculture extension system including adaptive research trials and demonstration.</li> <li>• Rehabilitation and establishment of research centers or stations related to fishery production.</li> <li>• Development of improved varieties for inland fish culture.</li> <li>• Identification and conservation of local aquatic resources.</li> <li>• Technical assistance to fish fry production on a communal basis.</li> </ul>
<b>3. Integrated Agriculture Development</b>	<ul style="list-style-type: none"> <li>• As described in “Crops: Research, Extension, and Others” section, <i>integrated agriculture</i> includes crop development and livestock &amp; fishery development.</li> </ul>		

Target / Goal	Agencies Responsible	Proposed Projects and Programs	
		Code	Title
<ul style="list-style-type: none"> <li>Households keeping livestock provided with adequate extension services.</li> <li>Livestock losses and diseases are reduced.</li> <li>Improved breeds are introduced at rural household level.</li> <li>Overall livestock production is increased through technology development.</li> </ul>	DLF/NAFRI NAFES	LF-1 Livestock Services and Extension Activities Strengthening (Lao-EU Project Ongoing) LF-2 Animal Health Improvement LF-3 Animal Improvement and Breeding System Assistance LF-4 Introduction of Animal Insurance System LF-5 Livestock Productivity Enhancement LF-6 National Animal Health Center Improvement (Planned by DLF) LF-7 Beef and Dairy Cattle Improvement Centers Strengthening (Planned by DLF) LF-8 Research Program of Fodder Crop Production and Sustainable Use of Pasture Land LF-9 Animal Disease Control Promotion Project in Indochina Region (by JICA ongoing)	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>Households practicing fishery production have adequate extension services.</li> <li>Improved varieties are introduced at the rural household level.</li> <li>Overall fishery production is increased through technology development.</li> <li>Fish feed becomes readily available.</li> </ul>	DLF/NAFRI NAFES	LF-10 Aquaculture Improvement and Extension LF-11 Fish Seed Center Rehabilitation/Expansion Project LF-12 Rural Aquaculture Development	International Organizations  Bilateral

## 6. Stabilization of Shifting Cultivation: Agro-forestry, NTFP, and Other Livelihood Systems (1/3)

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1. Rural Infrastructure &amp; Services Development</b>	Ref. 9. Rural Development for this sub-component		
<b>2. Participatory Land Allocation and Land-use Planning with Regard to Stabilization of Shifting Cultivation</b>  (As tailored and relevant for Shifting Cultivation areas both inside and outside NBCAs)	<ul style="list-style-type: none"> <li>• Limited capacity of Provincial and District mechanism for participatory land allocation and land-use planning.</li> <li>• Current application of land allocation (LA) procedures not linked to future family agricultural land needs for sustainable sedentary farming systems.</li> <li>• Reticence on part of families to disclose all land being used in swidden rotations to avoid additional taxes .</li> <li>• Methods for participatory village-level land-use planning not fully developed nor institutionalized into provincial &amp; district application.</li> </ul>	<ul style="list-style-type: none"> <li>• To stabilize shifting cultivation through land allocation and sustainable land use</li> </ul>	<ul style="list-style-type: none"> <li>• To develop Provincial /District land allocation capacity incorporated within area-based development programs &amp; projects.</li> <li>• To develop procedures for periodic review of allocation procedures and guidelines (for inside &amp; outside NBCAs).</li> <li>• T/A for further LA procedure development and introduction of procedures to inform and increase family consideration to address LA.</li> <li>• To develop procedures and capabilities for participatory land-use planning incorporated within area-based programs &amp; projects.</li> </ul>
<b>3. Adaptive Research for Sustainable Land-use through Soil &amp; Water Conservation and Agro-forestry Systems for Sloping Land</b>	<ul style="list-style-type: none"> <li>• Lack of adapted technologies for sustainable agricultural land-use systems.</li> <li>• Lack of adapted technologies for sustainable agro-forestry land-use systems including livestock &amp; fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>• To develop adaptive research systems for sustainable land-use through soil &amp; water conservation and agro-forestry systems for sloping land</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional development in linkage of FSEWs/SMS with NAFRI for on-farm adaptive farming systems research &amp; demonstration including livestock &amp; fisheries.</li> <li>• Identification and evaluation of potential farming system models for agro-climatic zones.</li> <li>• T/A and support for field crop, tree crop, livestock &amp; fishery, introduction and evaluation programs.</li> </ul>
<b>4. Adaptive Research/Extension on Sustainable Management of NTFPs for Subsistence and for Income Generation Needs</b>	<ul style="list-style-type: none"> <li>• Current Non-timber forest product (NTFPs) gathering methods and intensities are depleting NTFP and some are not sustainable.</li> <li>• Lack of developed technology for possible domestication, processing and market development for NTFPs.</li> </ul>	<ul style="list-style-type: none"> <li>• To develop adaptive research systems on sustainable management of NTFPs for subsistence and for income generation needs</li> </ul>	<ul style="list-style-type: none"> <li>• Institution development for linkage of relevant (NAFRI) Units/Sections with district FSEWs and provincial SMS in collaborative participatory study and development of sustainable village based management systems.</li> <li>• Develop guidelines and technology options for domestication, farm processing and market development of NTFPs.</li> <li>• Study on market potentials and development needs &amp; intelligence system.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
Ref. 9. Rural Development for this sub-component				
<ul style="list-style-type: none"> <li>Participatory LA are implemented by province/district themselves.</li> <li>Procedures for periodic review of allocation guidelines (for inside &amp; outside NBCAs) is completed based on land suitability classification for sustainable land-use &amp; family livelihood needs.</li> <li>Community understanding of benefits from land allocation is improved.</li> <li>Participatory land-use planning is implemented by province/district themselves based on community needs and land suitability classifications.</li> </ul>	CCLM MAF / DoF NAFRI NAFES	LW-1 SC-1.1 SC-1.2 SC-1.3 SC-2	Strengthening LUP & LA and Land Titling in Rural Area Stabilization of shifting cultivation in Southern Region Stabilization of shifting cultivation in Northern Region Upland development and poverty alleviation program Stabilization of shifting cultivation in NBCAs	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>Linking relevant NAFRI units/sections with FSEWs/SMS is strengthened for on farm adaptive farming systems research.</li> <li>Area-based sustainable farming system models for agro-climatic zones are established.</li> <li>Use of improved variety of crops, livestock &amp; fish is expanded.</li> </ul>	DoF/MAF NAFRI NAFES	SC-3 SC-6 SC-1 & SC-2	On-farm Agro-forestry Research for sustainable upland farming systems Agro-forestry and Sustainable Land Use Demonstration Stabilization of shifting cultivation in Southern & Northern Region and in NBCAs (Eg. PROPOSED UPLAND PROJEJECT Sida)	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>Linking relevant NAFRI Units/Sections with FSEWs and SMS is strengthened for collaborative participatory study and development of sustainable village based NTFP management systems.</li> <li>Research guidelines and technology options are completed for domestication, farm processing and market development of NTFPs to farmers .</li> <li>Market information for NTFP is provided to farmers.</li> </ul>	DoF /MAF NAFRI/MAF DoF /MAF NAFRI NAFES	SC-1 & SC-2 SC-5 SC-4 MR-8	Stabilization of shifting cultivation in Southern & Northern Region and in NBCAs NTFP Management & Conservation Research on Sustainable management and utilization of NTFPs Processing and Marketing Study of NTFPs	International Organizations  Bilateral

## 6. Stabilization of Shifting Cultivation: Agro-forestry, NTFP, and Other Livelihood Systems (2/3)

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>5. Demand Driven District Extension Response Service</b>	<ul style="list-style-type: none"> <li>• District extension service poorly trained and equipped.</li> <li>• Participatory methods for involvement of village communities in development planning not institutionalized into District Services.</li> <li>• District staff lack mobility and motivation due to low level of remuneration.</li> <li>• District extension service organization lacks multi-disciplinary capability.</li> <li>• Lack of adapted technology recommendations and extension aids for sustainable land-use through soil &amp; water conservation, agro-forestry and other farming systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Establish demand driven district extension service for sustainable land-use through soil &amp; water conservation, agro-forestry and other farming systems .</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening the AFETC's capacity for in-service training in participatory extension methodology.</li> <li>• Capital investment in extension facilities, vehicles and equipment.</li> <li>• In-service training in participatory village development planning in area based programs.</li> <li>• Procedures for on-the-job reinforcement training.</li> <li>• Assistance to A&amp;FETC &amp; SMS to development procedures .</li> <li>• On-the-job assistance to FSEWs to facilitate participatory Village Development Planning as a basis for extension response plans in area based programs.</li> <li>• Improve conditions &amp; remuneration for staff.</li> <li>• Technical training to district FSEWs in enterprises relevant to their particular districts.</li> <li>• Specialized technical training programs.</li> <li>• Develop linking FSEWs/SMS with NAFRI for on-farm adaptive farming systems research &amp; demonstration including livestock &amp; fisheries.</li> <li>• Training for farmer cooperators in target villages.</li> </ul>
<b>6. Cottage and Other Off-farm Income Development</b>	<ul style="list-style-type: none"> <li>• (Ref. 9. Rural Development)</li> <li>• Regulatory environment adverse for felling and selling trees planted on farms.</li> <li>• Lack of programs to promote nurseries and purchase of farmer produced tree seedlings.</li> <li>• Regulatory environment for Eco/Nature Tourism potentials in (NBCAs) is confused.</li> </ul>	<ul style="list-style-type: none"> <li>• To enhance farm and off farm income</li> </ul>	<ul style="list-style-type: none"> <li>• Capital investment in provision for district / village mobility.</li> <li>• Extension awareness programs on regulations &amp; assistance available.</li> <li>• Program design for Farm Nursery inclusion in plantation &amp; re-forestation programs.</li> <li>• Support for study of piloteco/nature tourism activities and develop models and guidelines for legislation &amp; regulation.</li> <li>• Examination of rules and regulations.</li> </ul>
<b>7. Village Level Financial Service Development</b>	<ul style="list-style-type: none"> <li>• Families lack access to finance for production inputs and farm development, necessary for adoption of agro-forestry systems, soil and water conservation measures and developing off-farm income generating activities.</li> <li>• Villager saving's abilities are marginalised due to lack of village level organization capable of mobilizing savings into village savings.</li> </ul>	<ul style="list-style-type: none"> <li>• To improve the access to rural finance in rural area</li> </ul>	<ul style="list-style-type: none"> <li>• FSEWs training and pilot programs in participatory development of village organization for establishment &amp; operation of village level savings and credit groups.</li> <li>• Implementation of extension awareness programs on Village Savings and Credit Groups (VS&amp;CG).</li> <li>• village training in organization &amp; operation of VSCGs</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
<ul style="list-style-type: none"> <li>• (Ref. 5. Human Development)</li> <li>• Extension staff given knowledge of participatory village development planning &amp; extension methodologies through in-service training courses as well as on-the-job reinforcement training</li> <li>• Farmers know the appropriate farming practices including agro-forestry</li> <li>• (Ref. 5. Human Development)</li> <li>• (Ref. 6. Crop)</li> </ul>	DoF/MAF NAFES	SC-1 & SC-2 SC-6 HD-1 HD-4 HD-6 HD-7 SC-4 AC-12	Stabilization of shifting cultivation in Southern & Northern Region and in NBCAs Agro-forestry and Sustainable Land Use Demonstration Strengthening agriculture and forestry Extension Services Strengthening Agriculture and Technical Education Capacity Program for Strengthening the Capacity of University Education in Agriculture and Forestry Agriculture and Forestry Education in Primary and Secondary Schools Development Research on Sustainable Management and Utilization of NTFPs Farming technology dissemination project	International Organizations Bilateral
<ul style="list-style-type: none"> <li>• Farm and off-farm income increase through agro-processing activities using cottage basing</li> <li>• cultivation of tree crops</li> <li>• promotion of tourism</li> </ul>	Provincial Offices MAF / DoF MAF / DoF NAFES	RD RD-1 RD-2	VADIRRA Phase 1 VADIRRA Phase II	International Organizations Bilateral
<ul style="list-style-type: none"> <li>• Rural finance development at grass roots level is enhanced.</li> <li>• Access between rural area and private financial sector is strengthened.</li> <li>• Sustainable saving and credit group is established and functioning well.</li> <li>•</li> </ul>	DoF /MAF DoF /MAF NAFES MO Finance	SC-1 & SC-2 RF-8	Stabilization of shifting cultivation in Southern & Northern Region and in NBCAs Expansion of Credit to Farmer Groups by APB	International Organization Bilateral



**6. Stabilization of Shifting Cultivation: Agro-forestry, NTFP, and Other Livelihood Systems (3/3)**

<b>Major Sub-Component</b>	<b>Constraints and Potentials</b>	<b>Objective</b>	<b>Required Action</b>
<p><b>8. Marketing of Farm &amp; Off-farm Products</b></p>	<ul style="list-style-type: none"> <li>• Poor infrastructure.</li> <li>• Lack of market information on products and prices.</li> <li>• Lack of processing facilities.</li> <li>• Many regulations &amp; procedures.</li> <li>• Lack of business training</li> <li>• Little quality control.</li> <li>• Lacking credit facilities</li> </ul>	<ul style="list-style-type: none"> <li>• To establish linkage for farm and off- farm products between farmer and market</li> </ul>	<ul style="list-style-type: none"> <li>• Study current situations and recommend for the private sector and government facilitative programs.</li> <li>• Design and conduct market studies.</li> <li>• Study on requirements for establishment of market &amp; price information services.</li> <li>• Improve and introduce new marketing methods.</li> <li>• Study of current situation, and provide guidelines for improvements to the regulatory environment.</li> <li>• Identify &amp; promote business opportunities.</li> <li>• Develop inspection &amp; quality control facilities.</li> <li>• Develop rural credit facilities.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs	
		Code	Possible Donor Source
<ul style="list-style-type: none"> <li>Adequate market &amp; price information for agriculture products is provided to farmers</li> <li>Information on processing requirements and improved techniques are provided to farmers.</li> <li>Adequate market &amp; price information on NTFPs is provided to farmers</li> <li>Advantageous business opportunities are extended.</li> <li>Inspection &amp; quality control facilities are established and function well.</li> </ul>	DoA DoF /MAF NAFRI NAFES MOCT	SC-1 & SC-2 Stabilization of shifting cultivation in Southern & Northern Region and in NBCAs MR-2 Agricultural Commodity Market Intelligence Project MR-4 Agricultural Product Grade and Classification Project MR-8 Processing and Marketing of NTFPs	International Organization Bilateral

## 7. Marketing

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1. Marketing</b>	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>• Lack of market information and linkage between farmers and markets causing seasonal gluts and shortage.</li> <li>• Poor access road and high transportation costs.</li> <li>• Market for inputs including seeds, fertilizer and agro-chemicals is not mature.</li> <li>• Lack of incentive to produce high quality industrial crops.</li> <li>• Barriers to market and trade such as regulations and control on the movement of produce both domestically and for exports.</li> <li>• Access to finance/credit for farmers is limited.</li> <li>• Insufficient understanding of the market economy among officials.</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>• The Lao government has prepared an agriculture development strategy (Vision 2020).</li> <li>• Certain agriculture products (livestock, commodity crops, e.g. coffee, and sticky rice) have competitive advantage on the international market.</li> <li>• The private sector's involvement in marketing activities has been steadily increasing.</li> <li>• It is widely observed that many farmers are becoming market-oriented as the market economy infiltrates rural</li> </ul>	<ul style="list-style-type: none"> <li>• To build a sound basis for market-oriented and sustainable agriculture development.</li> <li>• To offer a level playing field for farmers to produce crops through the incentive mechanism and in order to improve their livelihood.</li> </ul>	<ul style="list-style-type: none"> <li>• Establish a market information system to provide commodity market information to producers.</li> <li>• Improve access roads.</li> <li>• Encourage farmers' groups with adequate training for increasing marketing power in both input and output markets.</li> <li>• Establish a grading and classification system for the agriculture produces.</li> <li>• Revise regulations and controls on the inter-provincial movement of goods, import/export permits and licensing.</li> <li>• Study on Potential Market of Agricultural Products and NTFP</li> </ul>
<b>2. Agro-Processing</b>	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>• High transportation costs to market.</li> <li>• Poor access roads to transport inputs and outputs.</li> <li>• Limited small-scale agro-processing technical skill.</li> <li>• Lack of grading and classification systems for agriculture produce.</li> <li>• Lack of an inspection system for food hygiene.</li> <li>• Uncertain regulatory environment for foreign and domestic investment.</li> <li>• Farmer's credit opportunity is limited.</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>• Certain agro-processing products (livestock, weaving products, etc.) have a competitive advantage on the international market.</li> <li>• The private sector investment response in agro-processing has been</li> </ul>	<ul style="list-style-type: none"> <li>• To increase the value-added of agriculture produce.</li> <li>• To enhance the market competitiveness for agriculture produce in both the international and domestic markets.</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage farmers' groups with adequate training for agro-processing activities.</li> <li>• Improve access roads.</li> <li>• Establish grading and classification system for the agriculture produces.</li> <li>• Improve micro-finance services for agro-processing.</li> <li>• Establish an inspection system for food hygiene with laboratory facilities.</li> <li>• Revise and remove regulations for foreign and domestic investment.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
<ul style="list-style-type: none"> <li>Market information system is set up.</li> <li>Well-functioning farmer groups for selling products and purchasing goods are organized.</li> <li>Farm to market roads are improved.</li> <li>Grading and standardization systems as well as inspection services are established.</li> <li>Domestic and international trade is expanded.</li> <li>Market potentials are clarified in agriculture products and NTFP.</li> </ul>	MAF/ DOA, DOP NAFES MOCT	MR-2 MR-3 MR-4 MR-5 IO-1.2 MR-8 MR-9	Agricultural Commodity Market Intelligence Project Farmers' Groups for Agriculture Production (T/A) Agricultural Products Grade and Classification Project The Regulatory Framework based on a Market-friendly and Commercial approach (T/A) Strengthening Planning and Statistical Capacity of MAF (Ref. 2. Institutions & Organizations) Processing and Marketing Study of Non-Timber Forest Products (NTFPs) Wholesale Market Development Project	International Organizations  Bilateral
<ul style="list-style-type: none"> <li>Well-functioning farmer groups for agro-processing are organized.</li> <li>Farm to market roads are improved.</li> <li>Grading and standardization systems as well as inspection services are established.</li> <li>Access to credit opportunities in the village are improved.</li> <li>Food hygiene standards and inspection system for consumer health and welfare are established.</li> <li>Investment in agro-processing business is expanded.</li> </ul>	MAF/ DOA NAFES MOCT  RDO	MR-1 MR-4 MR-5 MR-6 MR-7 RD-4	Food Hygiene Inspection System Agricultural Products Grade and Classification Project The Regulatory Framework based on a Market-friendly and Commercial approach (T/A) Post-harvest and Agro-Processing Technology Center Study of the Export Potential and Input Imports of Agricultural Commodities Area-based Integrated Rural Development Programs (Ref. 9. Rural Development)	International Organizations  Bilateral

## 8. Rural Finance

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1. Reform and Strengthening of SOCBs (State Owned Commercial Banks)</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• Existence of non-viable SOCBs.</li> <li>• Weak financial management within SOCBs.</li> <li>• High non-performing loans.</li> <li>• Lack of adequate supervision by the Bank of Lao PDR.</li> <li>• Lack of access to credit by the private sector.</li> <li>• Lack of mid- and long-term credit for agribusiness and the farming sector.</li> </ul>	<ul style="list-style-type: none"> <li>• Enhance commercial banking capacity; increase commercial orientation; reduce non-performing loans; expand loan products and branch network.</li> <li>• Achieve financial viability.</li> <li>• Strengthening bank supervision by the Bank of Lao PDR through improved regulations and enforcement.</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of recommendation for the reform of SOCBs.</li> <li>• Restructuring of SOCBs based on the studies by ADB.</li> <li>• Introduce specialized and independent financial management into SOCBs.</li> <li>• Strengthen supervision of SOCBs by the Bank of Lao PDR.</li> <li>• Formulate plans for credit evaluation and appraisal procedures and asset-liability management.</li> <li>• Reduce the ratio of non-performing loans.</li> </ul>
<b>2. Strengthening of the Financial sector, which Contributes to Agriculture and Rural Development</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• Lack of capacity in financial institutions with regard to management, accounting, commercial finance, and risk management.</li> <li>• Incomplete legal framework regarding transaction among banks, financing contracts, and collateral.</li> <li>• Poor access to institutionalized finance in rural area.</li> <li>• Poor mechanism for deposit mobilization.</li> </ul>	<ul style="list-style-type: none"> <li>• To create a sound basis for the operation of commercial banks.</li> <li>• To create rural-based loan products and approaches to meet the needs of agribusinesses and the rural economy.</li> <li>• To diversify the source of savings among village people.</li> </ul>	<ul style="list-style-type: none"> <li>• Complete the ongoing T/A targeting the financial sector.</li> <li>• Develop a legal framework for bank settlement and its application capacity.</li> <li>• Develop a cash credit mechanism in rural area.</li> <li>•</li> </ul>
<b>3. Reform and Strengthening of APB</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• Poor operational efficiency, portfolio quality, lending policies and procedures, and inadequate staff capacity.</li> <li>• Poor deposit mobilization and interest rate structure on lending.</li> <li>• Financial fragile performance including absolutely low repayment rate.</li> </ul>	<ul style="list-style-type: none"> <li>• To make the Agriculture Promotion Bank (APB) a viable agricultural banking institution.</li> <li>• Gradually phase out banking interest rate controls and subsidized credit through APB.</li> <li>• Increase deposit mobilization.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction of commercially feasible rural banking system.</li> <li>• Separation of development role from APB.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs	
		Code	Title
<ul style="list-style-type: none"> <li>The operational performance of SOCBs is improved.</li> <li>Effective service through loan products to agribusiness and farming sector.</li> <li>The role of SOCBs in agriculture and agribusiness development is improved.</li> </ul>	Ministry of Finance	RF-1 In-service Training of SOCB Staff and the Expansion of the Training Center RF-2 SOCB's Operational Performance Improvement and Extension of Rural Banking RF-6 SOCBs' Loan Packages Development for Livestock and Fishery (Pilot Project) RF-10 SOCBs' Further Expansion of Rural Banking, Deposit Mobilization and Mobile Credit Scheme RF-12 SOCBs Expanding Credit to Farmers and Agribusiness	Multi-lateral institutions, ADB, WB, IMF, EU
<ul style="list-style-type: none"> <li>Formal banking system deposits and household savings are increased.</li> <li>Rural finance development at the grass roots level is enhanced.</li> <li>Access between rural area and private financial sector is strengthened.</li> <li>Finance in rural areas and the competition among financial institutions are promoted.</li> </ul>	Ministry of Finance	RF-3 Introduction of a Deposit Protection Scheme and Credit Information Bureau. (T/A)-Completed in March/April 2001. RF-4 Legislation for Debt Recovery and Security Enforcement, the Legal Basis for Bills of Exchange and Promissory Notes and Leasing. (T/A) –under process. RF-5 Continuation and Expansion of Credit and Saving Groups. RF-11 Expansion of Micro-finance Activities RF-13 Expansion of Micro-finance and Savings Group, Financial Deepening and Conversions of All VRFs (Village Revolving Funds) to Saving and Credit Groups.	Multi-lateral institutions
<ul style="list-style-type: none"> <li>Commercial orientation is installed in APB.</li> <li>Operating and lending procedure of APB is streamlined.</li> <li>Ratio of rural households receiving restructured APB loans is increased.</li> </ul>	Bank of Lao PDR	RF-7 APB Diagnostic Study (T/A). – under process RF-8 Expansion of Credit to Farmer Groups by APB. RF-9 APB Restructuring and Reorganization on the Recommendations of Diagnostic Study.	Multi-lateral institutions, ADB

## 9. Rural Development

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<p><b>1. Remote area agriculture development approach</b></p>	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>• Poor access to remote area prevents the development of market oriented agriculture.</li> <li>• Agriculture is mainly at subsistence level.</li> <li>• Most farmers in remote villages have no access to new technology or improved inputs.</li> <li>• Access to formal credit services is poor in remote villages.</li> <li>• Marketing infrastructure is insufficient.</li> <li>• PAFS&amp;DAFO extension staff and research outputs are not readily available due to remoteness.</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>• There are huge potentials for the development of commercial crops in remote areas.</li> <li>• Land and water resources are available in various climatic zones.</li> <li>• Using resources and climatic conditions, many commercial crops/commodities can be produced.</li> <li>• Fruit crops, industrial crops (such as cotton, sugarcane and sericulture), NTFP (such as paper mulberry, cardamom and mushroom), livestock and aquaculture have potential.</li> <li>• Cottage-type agro-processing industry can also be developed using raw materials to be produced based on area specific conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• To promote market-oriented agriculture in remote rural areas through village initiative,</li> <li>• To increase living standards and reduce poverty in remote villages through agricultural development initiative.</li> </ul>	<ul style="list-style-type: none"> <li>• Project Preparation</li> <li>• Identification of potential villages for the development of market orientation agriculture based on selection criteria to be established in each province,</li> <li>• Conduct of participatory surveys in selected villages (or group of villages) and clarification of local needs and development potentials,</li> <li>• Formulation of development plans (rural infrastructure, extension, and micro-credit) for the selected villages,</li> <li>• Establishment of monitoring and evaluation plan, and</li> <li>• Training of PAFSs/DAFOs staff for their extension activity.</li> <li>• Construction Works and Project Operation</li> <li>• Construction works for rural infrastructure,</li> <li>• Demonstration plots operation,</li> <li>• Farmers field school operation using the demonstration plots,</li> <li>• Micro-credit introduction and operation,</li> <li>• Construction of marketing facilities,</li> <li>• Monitoring of the sub-project, and</li> <li>• On-the-job training of PAFSs/DAFOs staff.</li> <li>• Closing stage</li> <li>• Preparation of monitoring and evaluation report,</li> <li>• On-the-job training of PAFSs/DAFOs staff</li> </ul>
<p><b>2. Poverty alleviation approach</b></p>	<p><b>&lt;Constraints&gt;</b></p> <ul style="list-style-type: none"> <li>• Rural population in remote villages do not receive adequate social services - communication, transport, education, or public health.</li> <li>• Although RDO has been established in each Province, staff capacity in technical service and planning is still very limited.</li> <li>• Inequality between urban area and rural area is a concern.</li> <li>• Monitoring of on-going RDO activity is not functioning well, particularly for Focal Site Development.</li> <li>• Coordination between RDO and other line agencies are not fully undertaken.</li> </ul> <p><b>&lt;Potential&gt;</b></p> <ul style="list-style-type: none"> <li>• In some area, natural resources are abundant.</li> </ul>	<ul style="list-style-type: none"> <li>• To alleviate rural poverty and improve the livelihood of the rural population through improvement/development of rural infrastructure/facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of remote low-income villages based on selection criteria to be established (or revised) in each province.</li> <li>• Training of RDO and relevant dep. staff for participatory surveys and project planning.</li> <li>• Conduct of participatory survey in the selected villages, and clarification of local needs and potentials.</li> <li>• Formulation of plans for rural infrastructure improvement and/or development where beneficiaries are involved.</li> <li>• Formulation of O&amp;M plans involving beneficiaries.</li> <li>• Construction of rural infrastructure based on the plans with beneficiary participation,</li> <li>• Capacity building of staff in the relevant agencies and village leaders mainly on OJT basis.</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs	
		Code	Title
<ul style="list-style-type: none"> <li>• Market-oriented agriculture is expanded in remote rural areas.</li> <li>• Farmers' production technology is improved in high value produce.</li> <li>• Supply of market-oriented produce is increased both to external and internal markets.</li> <li>•</li> <li>• -Phase I (9 years): 300 villages</li> <li>• -Phase II (10 years): 300 villages</li> <li>•</li> <li>•</li> </ul>	MAF/PAFS in Each Province NAFES	RD-1 Village-led Agriculture Development Initiative in Remote Rural Area (VADIRRA) Phase I  (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  RD-2 & RD-3 RD-2 Village-led Agriculture Development Initiative in Remote Rural Area (VADIRRA) Phase II  (1) VADIRRA in Xaisomboun and Xiangkhouang provinces; 100 villages (2) VADIRRA in Xaignabouri, Louangphrabang and Houaphan provinces; 100 villages (3) VADIRRA in Oudomxai, Bokeo, Louangnamtha and Phongsaly provinces; 100 villages  RD-3 Integrated Agricultural and Rural Development Project in Boloven Plateau	International Organization  Bilateral
<ul style="list-style-type: none"> <li>• Social service delivery is improved in remote area.</li> <li>• Suitable measures are taken for sustainable O&amp;M from financial and institutional points of view.</li> <li>-Phase I (9 years): 1,500 villages</li> <li>-Phase II (10 years): 1,500 villages (During 1996-2000 period, about 950 villages have been covered by the Focal Site Approach.)</li> </ul>	Rural Development Office in Each Province	RD-4 Area-based Integrated Rural Development Program Phase I RD-5 Area-based Integrated Rural Development Program Phase II	International Organization  Bilateral



## 10. Irrigation

Major Sub-Component	Constraints and Potentials	Objective	Required Action
<b>1. Small Scale Irrigation Development and Management through supporting of Irrigation Management Transfer (IMT) (Implementation)</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• Low agricultural productivity.</li> <li>• Deterioration of existing facilities.</li> <li>• Weakness of Water Users' Association (WUA).</li> <li>• Insufficient preparation of IMT in terms of governance, regulation, O&amp;M, small market etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Facilitate full transfer of irrigation scheme to the farmers.</li> <li>• Increase agricultural productivity, encouraging crop diversification.</li> <li>• Increase food security and income.</li> <li>• Improve watersheds by reducing shifting cultivation and promoting tree planting in mountainous area.</li> </ul>	<ul style="list-style-type: none"> <li>• Assist irrigators and O&amp;M of irrigation systems.</li> <li>• Rehabilitation of existing schemes.</li> <li>• Construction of district feeder road.</li> <li>• Providing capacity enhancement to PAFs and DAFOs.</li> <li>• Support to the institution and VDF process.</li> </ul>
<b>2. Supporting of Irrigation Management Transfer (IMT) (TA)</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• Low agricultural productivity</li> <li>• Deterioration of existing facilities</li> <li>• Weakness of Water Users' Association (WUA)</li> <li>• Insufficient preparation of IMT in terms of governance, regulation, O&amp;M, small market etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Establish database on the existing irrigation schemes.</li> <li>• Establish data base on potential community managed irrigation schemes.</li> <li>• Provide necessary information and recommendation for accelerating and supporting IMT.</li> </ul>	<ul style="list-style-type: none"> <li>• Inventory of existing irrigation schemes</li> <li>• Inventory of potential of community managed irrigation schemes</li> <li>• Review &amp; recommend schemes management systems</li> <li>• Prioritize existing schemes for implementation</li> </ul>
<b>3. Best irrigation use of exploited water resources with promotion of Diversified Agriculture</b>	<p>&lt;Constraints&gt;</p> <ul style="list-style-type: none"> <li>• Low agricultural productivity.</li> <li>• Deterioration of existing facilities.</li> <li>• Weakness of Water Users' Association (WUA).</li> <li>• Limited technical know-how to promote crop diversification.</li> <li>• Damage to agricultural product by flooding especially along the Mekong River.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase agricultural productivity through encouraging diversification to increase overall agricultural production on a sustainable basis.</li> <li>• Increase food security and income.</li> </ul>	<ul style="list-style-type: none"> <li>• Rehabilitate and construct medium to large-scale irrigation schemes in cooperation with community.</li> <li>• Provide and construct of flood protection facilities for sustainable use at flood-prone areas.</li> <li>• Provision of appropriate extension services to farmers.</li> <li>• Provision of capacity enhancement to PAFs and DAFs.</li> <li>• Support to the VDF management.</li> <li>• Establish of upland crop irrigation engineering center and pilot area.</li> <li>• Provide necessary data and research.</li> <li>• Establishment of training curriculum to train staff concerned and farmers.</li> </ul>
<b>4. Groundwater Irrigation Development</b>	<ul style="list-style-type: none"> <li>• &lt;Constraint&gt;</li> <li>• Shortage of surface irrigation water at specific area.</li> <li>• &lt;Potential&gt;</li> <li>• Substantial groundwater potential to be considered as supplemental irrigation water</li> </ul>	<ul style="list-style-type: none"> <li>• Promote high valued commodity crops by best use of groundwater resources</li> </ul>	<ul style="list-style-type: none"> <li>• Investigation of groundwater potential.</li> <li>• Provision of pilot model groundwater irrigation schemes.</li> <li>• Extension of groundwater irrigation schemes linking with rural development programs.</li> </ul>
<b>5. Flood Disaster Mitigation</b>	<ul style="list-style-type: none"> <li>• &lt;Constraint&gt;</li> <li>• Serious damage by flooding to agricultural product and properties along Mekong tributaries</li> </ul>	<ul style="list-style-type: none"> <li>• Secure agricultural production and properties at flood-prone area along tributaries of Mekong River from wet season flooding</li> </ul>	<ul style="list-style-type: none"> <li>• Detail assessment of damaged area by wet season flooding</li> <li>• Selection of priority</li> <li>• Planning, rehabilitation and upgrading of flood protection facilities</li> </ul>

Target / Goal	Agencies Responsible	Proposed Projects and Programs		
		Code	Title	Possible Donor Source
<ul style="list-style-type: none"> <li>Existing irrigation schemes with full management transfer are rehabilitated.</li> <li>(approximately 100,000 ha)</li> </ul>	DOI/MAF NAFES	IR-2 IR-3 IR-1 IR-5	Decentralized Irrigation Development and Management Project (DIDMP) Agriculture Development Project (ADP) Community Managed Irrigation Sector Project-2 Community Managed Small Scale Irrigation Project	ADB World Bank  International Organizations Bilateral
<ul style="list-style-type: none"> <li>Specific information and recommendations to support IMT process are provided.</li> </ul>	DOI/MAF	IR-4	TA on Accelerated IMT	International Organizations Bilateral
<ul style="list-style-type: none"> <li>Rice yields are improved through effective use of irrigations.</li> <li>Damage to agriculture products by flood is mitigated.</li> <li>VDF management is improved.</li> </ul>	DOI/MAF NAFES	IR-6 IR-7 IR-8 IR-10	TA of Water Resources Development in Northern and Central Region TAs for Best Irrigation Use of Exploited Water Resources for Diversified Agriculture Development Project Best Irrigation Use of Exploited Water Resources for Diversified Agriculture Development Projects Technical Cooperation for Upland Crop Irrigation Engineering Center	International Organizations Bilateral
<ul style="list-style-type: none"> <li>Groundwater is effectively and efficiently utilized for diversification of crops in a sustainable manner.</li> </ul>	DOI/MAF NAFES	IR-9	Groundwater Irrigation Development and Management	International Organizations Bilateral
<ul style="list-style-type: none"> <li>Out of 150 km of river course bringing about flooding along Mekong Tributaries, 120 km are provided with permanent structure to protect surrounding area from flooding.</li> </ul>	DOI/MAF	IR-11	Flood Disaster Mitigation	International Organizations Bilateral

## **7.2 Selection of Programs and Projects for Implementation before 2010**

### **7.2.1 Approach to Sequencing**

The Action Plan proposed here lists 110 projects and programs covering all agriculture sub-sectors, excluding forestry. Eight of these are on-going projects. The 102 projects and programs that are included would be spread over the 19 years of the Action Plan. The commencement and the time period of implementation would differ from project to project and as a general rule, programs could take a longer period of time.

This is an exhaustive list and not all projects and programs would yield the same return to the economy in terms of the net impact on agricultural growth. In addition, the gestation period for each of these projects and programs is different. Some programs such as fish fingerling development or seed multiplication could yield visible results in a couple of years whereas others such as irrigation development, agro forestry tree plantations or research programs would require several years of investment before any returns are realized. Human resource development also requires a sufficiently long period of years before staff are recruited and trained and are able to use their skills to yield visible results. Construction projects involve a gestation period of several years for preparation of designs and construction and years of investment before the project could realize returns as in the case of new irrigation projects.

An Action Plan covering two decades also means that that the list of programs and projects should be viewed as a rolling plan with a need for a regular review, perhaps every three years. This is necessary in order to assess the progress in the context of priorities and constraints and to ensure that projects address the most important needs that may arise from time to time in the development process.

In deciding the sequencing for this large number of projects, it is important to ensure that there are sufficient projects that create a base for the development of human and capital resources. There also needs to be sufficient emphasis on training and capacity building; on investments in land and water development to provide for further expansion of the production base. There also has to be a mix of capital and recurrent expenditure to ensure that an adequate portion of the annual budgetary envelope is made available for recurrent expenditures such as for payment of salaries, other staff financial incentives and for the smooth implementation of programs.

The most important need for sequencing is because of the need to select a mix of programs and projects that would be synchronized and interdependent so that acting in concert these could have maximum positive impact on agricultural growth. At the same time, the selection should be such that they are within the overall resource or budget envelope for each year as not all these projects and programs could be implemented at once.

The approach to sequencing is clearly dependent on the primary goal or objective of the Action Plan. Several criteria could be used to decide on prioritization and sequencing. The obvious one is the estimated economic rate of return (ERR). But there are several other considerations such as the impact on rural development, the effect on poverty alleviation, employment and income generation, the impact on beneficiaries, the need to move out of subsistence farming. There are all matters that require carefully consideration. There are also other factors such as the multiplier effect of investments and forward and backward linkages. However, in sequencing there is also a need to examine the basic supply requirements for successful implementation of projects and programs. These include the availability of inputs for projects and programs, availability of skilled manpower, the capacity of the implementing agency, and the availability of funds for maintaining and operating the project facility after completion.

The sequencing criteria are as follows:

- Projects/Programs directly impacting on value added (GDP).
- Provincial and District implementation capacity is currently available for projects/program
- Projects/Programs that are low cost and quick yielding.
- Projects involving 'foundation investment' e.g. training of trainers, extension training, foundation seed production and multiplication.
- Projects/programs to restore sub-sectoral balance and increase budgetary allocation for recurrent expenditure.

#### 7.2.2 Assessment for Sequencing

Based on the above criteria, a preliminary assessment for prioritization and sequencing was made. All the projects were divided into three categories in terms of project commencement, namely: (i) Category S: on-going project, ii) Category A: the project will commence before 2010, and (iii) Category B: the project will commence after 2011. After the preliminary assessment, the opinion of MAF for prioritization are also considered. The results are shown in Attachment 2 "List of

Proposed Programs and Projects”. The number of proposed project by category for each sub-sector is summarized below:

**Table 7.2 Sequence of Proposed Programs and Projects**

Sub-sector	Nos of programs/ projects	On-going	2001-2010	2011-2020
		(S)	(A)	(B)
1. Land and Water Resource Development	9	-	4	5
2. Institution and Organization	13	-	7	6
3. Human Resource Development	7	-	5	2
4. Field Crops	22	2	13	7
5. Livestock and Fisheries	12	2	6	4
6. Stabilization of Shifting Cultivation	9	-	6	3
7. Marketing and Agro-processing	9	-	5	4
8. Rural Finance	13	2	5	6
9. Rural Development	5	-	3	2
10. Irrigation	11	2	4	5
<b>TOTAL</b>	<b>110</b>	<b>8</b>	<b>58</b>	<b>44</b>

## CHAPTER 8 ENVIRONMENTAL ASSESSMENT

### 8.1 Environmental Laws and Regulations.

In 1999, the government passed an Environmental Protection Law.<sup>1/</sup> This was followed by the 2<sup>nd</sup> National Environmental Action Plan 2000<sup>2/</sup> and Regulations on Environmental Assessment.<sup>3/</sup>

#### (1) Environmental Protection Law (ELP)

After discussing the general provisions of the EPL, Article 5 states the Basic Principles for Environmental Protection.

- (a) Environmental protection shall be the priority consideration and environmental mitigation and restoration are considered to be less preferable, but also important activities.
- (b) The national socio-economic development plan shall include provisions to protect the environment and natural resources.
- (c) All persons and organizations residing in the Lao PDR have obligations to protect the environment.
- (d) Whoever causes damage to the environment is responsible for the impact under the law.
- (e) Natural resources, raw materials and energy shall be used in an economical manner, which minimizes pollution and waste and allows for sustainable development.

Section 4 of Article 5 covers the Polluter Pays Principle (PPP), namely the entity causing damage is responsible for that damage and has to take measures to minimize/eliminate the damage and/or to restore the site to its original condition. However, this is difficult to enforce for farming households, especially subsistence farmers. The most appropriate action is to demonstrate and promote environmentally sustainable alternatives.

Article 7 deals with the prevention of environmental degradation. Basically all new projects should have an environmental assessment undertaken on them, usually termed an Initial Environmental Examination (IEE), to assess the positive and negative environmental impacts of the project. If the assessment indicates that

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<sup>1/</sup> Lao PDR (1999). Environmental Protection Law. National Assembly, No. 99/02/NA 3 April 1999.

<sup>2/</sup> Science, Technology and Environmental Agency (2000a). National Environmental Action Plan 2000. Prime Minister's Office Lao PDR. Oct. 2000.

<sup>3/</sup> Science, Technology and Environmental Agency (2000b). Regulation on Environmental Assessment in Lao PDR. No. 1770/STEA. Prime Minister's Office Lao PDR. 3 Oct. 2000.

there may be important negative impacts then an Environmental Impact Assessment (EIA) must be undertaken. An EIA is a process of estimating environmental impacts by development projects and activities. An EIA identifies methods and standards for mitigating and reducing such anticipated impacts on the social and natural environment. This is covered under Article 8. This article states that STEA will issue general regulations and procedures and methods for EIA, but each sector (e.g. MAF) is responsible for issuing its own regulations on EIA procedures and methods. As yet, MAF has not produced any documents. Irrespective of this, any proposed project should have an Environmental Certificate of Compliance (ECC) before it can commence. However, it is difficult to enforce this for small farmers opening up new land. Again the better option is to demonstrate appropriate land-use practices. For new large-scale arable and pastoral development an ECC is a necessity. The Format to obtain an ECC is described in Appendix 18.

According to Article 8, “Development projects and activities operating prior to the enactment of this law that have caused losses to the environment shall propose measures, procedures and actions to mitigate such losses to the concerned environment management and monitoring unit for issuance of an ECC.” This latter is very pertinent to several ongoing initiatives in the farming sector. These cover such activities as unsustainable shifting cultivation, poor arable and pastoral practices both under rainfed and irrigation conditions, unsustainable use of natural resources both on land and in water and inappropriate land use, especially in upper watershed areas.

This is why this M/P study has proposed several programs and projects to counter these adverse environmental and social impacts. These include:

- (a) Stabilizing Shifting Cultivation.
- (b) Watershed Management.
- (c) Flood Mitigation.
- (d) Irrigation Water Management.
- (e) Appropriate Farming Practices for all farming systems.
- (f) Sustainable use of Rivers, Forests and Non-Timber Forest Products (NTFPs) pertinent to livelihood systems.
- (g) Small-scale Industry Promotion based on Managed Renewable Resources.

In order to accomplish the above programs the M/P is promoting several enabling activities such as: strengthening institutions and organizations; making available

farm inputs including improved seeds and animal health requirements; promoting human resource development; improving rural financial structures; and investigating market opportunities for farm and non-farm products.

The above are mitigation measures to counter adverse environmental and social effects of existing practices in all private and public sectors. As stated above, all new large-scale public and private agricultural projects must obtain an ECC from STEA before they commence. The EPL states that evaluations such as an IEE and EIA must include the participation of local administrations, mass organizations, and local people likely to be affected by site-specific projects.

### (2) National Environmental Action Plan (NEAP)

A more detailed elaboration of environmental and social concerns regarding agricultural projects is given in Appendix 19. Also, the NEAP (STEA 2000a) discusses environmental concerns in the Roads/Transport and Mining Sectors (P92/94). This latter is important where it may directly affect agriculture by providing materials (limestone/dolomite/gypsum) or through possible water pollution affecting aquatic animals and irrigation water.

Not much is said in the NEAP about the agricultural sector. The NEAP states that rapid population growth, lack of adherence to development plans and inappropriate land use are major issues causing damage to the natural and social environment. It highlights unsustainable forest use and shifting cultivation as important causes of environmental degradation. However, over the past 20 years an estimated 350,000 ha. of forests have been cleared for permanent agriculture, principally in lowland areas, mainly resulting from a 67% population increase. Despite gains in productivity, agricultural expansion will still continue unless alternative employment opportunities are created for the increasing rural population. This is why emphasis has to be placed on establishing or expanding on and off-farm activities, with the backing of an improved social and physical infrastructure with appropriate extension and marketing advice.

### (3) Regulations on Environmental Assessment (EA)

General principles are first expounded in Articles 1 & 2 in Part I of the “Regulations on Environmental Assessment (EA) in Lao PDR” (STEA 2000b). These general principles cover the establishment of a uniform environmental assessment, the provision of common foundations for sectorial agencies to issue sector-specific EA regulations within 2 years and the furnishing of definitions.



Part II provides guidelines for the environmental assessment process and procedures. Article 3 provides the following information.

- (a) Each Development Project Responsible Agency (DPRA) must ensure that any development project undertakes an EA in accordance with this and line ministry regulations. The EA must include at least a project description to enable the DPRA to perform an Environmental Screening (ES) under Article 7. If the project is not exempt under Article 8, then the EA must include an IEE as specified under Article 9. For some projects through the findings of the IEE, an EIA is required as specified in Articles 11 to 14 of the above Regulation.
- (b) The steps of the EA process are specified. These are given in Chart 1 in Appendix 19. They start with a project description and finish with monitoring and evaluation of an agreed Environmental Management Plan. The general format of an IEE report for projects is given in Appendix 19.
- (c) Each project must follow the steps laid down in Articles 3 (2) and 5 (2).
- (d) No construction or other physical activities shall be undertaken until STEA has issued an Environmental Compliance Certificate (ECC).
- (e) Within 6 months of the enactment of this Regulation, (that is by 3 April 2001) each DPRA must make a list of all projects within its sector area of responsibility that did not undertake an EA as part of the project approval cycle, but have caused significant impacts on the environment. For MAF, this may apply to some irrigation schemes shifting cultivation/poppy eradication programs and commercial crop development projects.
- (f) Within 6 months of the enactment of this Regulation, STEA must put in place qualification guidelines for all persons, entities and organizations who undertake EAs in the country.

Articles 4 to 6 cover responsibilities for costs, steps in the EA process and public involvement; this latter is critical to the whole EA procedure. Article 7 describes the project description requirements to be provided to the DPRA. This description must be circulated to all interested parties and their comments have to be considered by the DPRA in its ES decision. (Article 8).

Article 8 deals with project screening. Based on the project description including an initial Environmental Screening, the DPRA assembles an adhoc Project Review Team to complete a final ES. Its purpose is to separate projects that require no further environmental assessment (exempt projects) from those that require further environmental assessment (non-exempt projects). Thus, all projects and programs should have an Environmental Screening (ES) to ascertain if an IEE (and an IEA) is required.

Exempt projects are such in size, nature and location that they cause minimal negative environmental and social impacts or bring about positive environmental and social changes or are neutral. Many of the programs and projects in the M/P study fall into this 'exempt' category. These include most if not all in the following sub-sectors: Institutions and Organizations; Marketing; Rural Finance; Land and Water Resource Development; Human Resource Development; Stabilization of Shifting Cultivation; and Rural Development. However, exempt projects have to be issued with a Certificate of Compliance (CC) by STEA after clearance by the appropriated responsible agency (DPRA).

Non-exempt projects should undertake an IEE. If as a result of the IEE, further studies are required, then an EAI is necessary. Projects that may require an IEE are found in the Crops, Livestock and Irrigation sub-sectors of the M/P study.

Articles 9 & 10 of the Regulations for EA deal with IEE protocol and Articles 11 to 13 explain the format for undertaking an EIA. In both the IEE and the EIA an Environmental Management Plan (EMP) has to be compiled. This also applies to some exempt projects/programs such as shifting cultivation stabilization. Article 14 deals with EMP approval procedure. Only after it has been approved will a CC be issued by STEA after clearance by the appropriate DPRA. Article 15 deals with monitoring and evaluation (M&E). As a result of M&E changes to the EMP may be proposed.

Articles 16 & 17 deal with awards and sanctions and Articles 18 to 20 specify final provisions. These state that no person or body is exempt from the provisions in the document, that STEA is entrusted to implement the regulations and that it becomes legal as soon as it is signed, superseding previous regulations.

There are six annexes. The first gives a flow diagram for the whole environmental assessment process. This is included in Appendix 19 of this report. Annex 2 deals with definitions, Annexes 3 & 4 cover IEE and EIA procedure respectively, Annex 5 details the contents of Environmental Compliance Certificates and Annex 6 specifies the contents for an Environmental Monitoring Report. In addition there are forms for comments on IEE, EIA and Terms of Reference. As stated previously, these are general regulations. Each line agency such as MAF has to produce its own regulations, but the format and content of the above regulations should be followed closely.

#### (4) Environmental Action Plan for Sustainable Agricultural and Rural Development

Another document of relevance is the Draft Terminal statement on an Environmental Action Plan for Sustainable Agricultural and Rural Development (EAP/SARD) (FAO Bangkok December 2000).<sup>4/</sup> This document stresses the need for multi-sectoral rural development planning with environmental considerations built into the process from the start. It emphasizes the need to have participatory planning and public involvement at the local level, to reconcile local development plans with national development goals and to reconcile SARD methodology with the Government's focal site program development strategy. A National Workshop was held and the participants identified 40 constraints to implement SARD. The participants provided possible solutions to overcome these constraints. It proposed that Strategic Environmental Assessments be an integral part of all initiatives for socio-economic development and that there be prioritization and preparation of specific programs/projects for implementation of EAP/SARD. Even though this M/P study is for the Agricultural Sector, it incorporates a broad development approach and is not narrowly focussed on agriculture. Thus, it is following the recommendations of the FAO initiative.

#### (5) JICA's Environmental Guidelines.

JICA has issued environmental guidelines for several sectors.<sup>5/</sup> The one for the Agricultural Sector is unavailable, but the procedures for each sector are uniform. The Guidelines start with a flow diagram of the procedure for environmental consideration. This is similar to that given in Appendix 19. Chapter 1 gives an environmental consideration outline. This is to determine whether a project may have significant (negative) environmental impacts. Chapter 2 deals with the project and site description and Chapter 3 discusses screening. This is a step that is taken at the project initiation stage. It is a process to judge whether a development project requires an environmental impact study or not. This is followed by Chapter 4, which discusses scoping. This occurs at the project site and with concerned officials. It will confirm if the initial environmental screening is correct and whether or not an IEE is required. Thus the JICA environmental guidelines are similar to those of STEA

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<sup>4/</sup> FAO 2000. Draft Environmental Policy and Planning for Sustainable Agriculture and Rural Development (Phase II). Lao PDR Terminal Statement. Environmental Action Plan for Sustainable Agriculture and Rural Development (EAP/SARD). FAO Bangkok Dec. 2000.

<sup>5/</sup> JICA 1992. Environmental Guidelines for Infrastructure Projects: V River and Erosion Control. Japan International Cooperation Agency Tokyo Sept. 1992.

## 8.2 Initial Environmental Screening for Priority Projects

This M/P study proposes several programs and projects that are general in nature covering such things as human resource development, marketing and banking or are as yet not site specific and cover general topics as the promotion of improved farming technologies and methods. Therefore, at present all that can be done is to undertake an Environmental Screening for all the Priority Projects proposed in the M/P study. This screening highlights whether projects or programs, once they are specified, will require an IEE. Many of the proposals will result in positive environmental and social benefits or are neutral. Therefore, such initiatives should not require an IEE. However, these interventions still require a Certificate of Compliance before they can officially proceed. Also all projects that directly or indirectly affect communities should be formulated by and with the active participation of these communities. A summary of the Environmental Screening for all Priority Projects is given in Table 8.1. A full ES is given in Appendix 18. including the Environmental Matrix for ES.

**Table 8.1 Environmental Screening for all Priority Projects**

Sub-sector and Projects/Programs		Environmental Screening	IEE Required
<b>1. Land and Water Resource Development</b>			
LW 1	Strengthening LUP & LA and land Titling	Positive	No
LW 3	Watershed management	Positive	No
LW 4	Agro-zone classification, land management and farming systems development	Positive	No
LW 7	Rehabilitation and expansion of meteo-hydrology stations for agricultural development and flood control	Neutral	Case by Case
<b>2. Institutions and Organizations</b>			
<i>IO 1</i>	<i>Institutional Development and Strengthening of MAF</i>		
IO 1.1	Strengthening administration & management procedures	Neutral to positive	No
IO 1.2	Strengthening planning and statistical capacity	Neutral to positive	No
IO 1.3	Strengthening human resource development management	Neutral to positive	No
<i>IO 4</i>	<i>NAFRI Strengthening Program</i>		
IO 4.1	Institutional strengthening and restructuring	Neutral to positive	No
IO 4.2	Staff capacity building	Neutral to positive	No
IO 4.3	Research upgrading	Neutral to positive	No
IO 6	Plant quarantine strengthening	Positive	No
<b>3. Human Resources Development</b>			
HR 1	Strengthening agriculture and forestry extension services	Positive	No
HR 2	Development of district in-service training and farmer training in agriculture and forestry	Positive	No
HR 4	Strengthening the technical education capacity in agriculture and forestry	Positive	No
HR 5	Irrigation technician school improvement	Positive	No
HR 6	Strengthening the university education capacity in agriculture, forestry and irrigation	Positive	No

(Table continued)

**Table 8.1 Environmental Screening for all Priority Projects (continued)**

Sub-sector and Projects/Programs		Environmental Screening	IEE Required
<b>4. Field Crops: Extension, Research and Others.</b>			
AC 1	Rice seed multiplication systems improvement	Neutral	Yes
AC 3	Integrated upland agricultural research	Positive (possibly negative)	Case by case
AC 4	Crop diversification	Variable check for agro-chemicals, irrigation etc.	Case by case
AC 5	Outer Cityure promotion		
AC 7	Export oriented crop promotion		
AC 8	Fruit crop promotion in the northern region	Neutral to positive (check for agro-chemicals etc.)	Usually no, but case by case
AC 9	Fruit crop promotion in the southern region		
AC 10	Sericulture development	Neutral	No
AC 12	Farming technology dissemination	Neutral	No
AC 14	Coffee cultivation technology research	Neutral to positive	Case by case
AC 15	Vegetable cultivation technology research	Neutral to positive	Case by case
AC 16	Fruit cultivation technology research	Neutral to positive	Case by case
AC 21	Basic seed production technology development	Neutral	No
AC 22	Upland crop cultivation technology research	Positive	No
<b>5. Livestock &amp; Fisheries; Extension, Research and Others</b>			
LF 2	Animal health and Quarantine Improvement	Positive	No
LF 5	Livestock productivity enhancement	Neutral to positive	No
LF 6	National animal health center improvement	Neutral to positive	No
LF 10	Aquaculture improvement and extension	Neutral to positive	Case by case
LF 11	Fish seed centers: rehabilitation/expansion	Neutral to positive	Case by case
LF 12	Rural aquaculture development	Variable	Case by case
<b>6. Stabilization of Shifting Cultivation: Agro-forestry, NTFPs and Related Livelihood Activities</b>			
SC 1	<i>Stabilization of shifting cultivation (outside NBCA)</i>		
SC 1.1	Shifting cultivation stabilization in the southern region	Positive, but some may be protected areas	Generally No
SC 1.2	Shifting cultivation stabilization in the northern region		
SC 1.3	Upland development and poverty alleviation		
SC 2	Stabilization of slash and burn inside NBCAs	Positive, but inside conservation areas	Generally No
SC 3	On-farm agro-forestry research for sustainable upland farming systems.	Neutral to positive	Case by case
SC 4	Research on sustainable management and utilization of NTFPs	Neutral to positive	Case by case
<b>7. Marketing and Agro-processing</b>			
M 2	Agricultural commodity market intelligence	Neutral	No
M 4	Agricultural products grade and classification	Neutral	No
M 7	Export potential and inputs supply study of agricultural commodities	Neutral	No
M 8	Processing and marketing of non timber forest products (NTFP)	Normally positive, possibly negative	Case by case
M 9	Wholesale Market Development Project	Variable	Case by case

(Table continued)

**Table 8.1 Environmental Screening for all Priority Projects (continued)**

Sub-sector and Projects/Programs		Environmental Screening	IEE Required
<b>8. Rural Finance</b>			
RF 1	In-service training of SOCB staff and the expansion of the training center	Neutral	No
RF 2	SOCBs operational performance improvement and extension of branch banking	Neutral	No
RF 8	Expansion of credit to farmer groups by APB	Neutral	No
RF 9	APB restructuring and reorganization on the recommendations of a diagnostic study	Neutral	No
RF 11	Extension and expansion of activities in the UNDP/CDF Micro-finance Training Center to all provinces	Neutral	No
<b>9. Rural Development</b>			
<i>RD 1</i>	Village-led agriculture development initiatives in remote rural areas (VADIRRA)		
RD 1.1	VADIRRA in Champasak, Attapu, Saravan and Xekong provinces	Variable	Case by case
RD 1.2	VADIRRA in Khammouan and Savannakhet provinces	Variable	Case by case
RD 1.3	VADIRRA in Vientiane Municipality, Vientiane and Borikhamxai provinces	Variable	Case by case
RD 3	Integrated Agricultural and Rural Development in Boloven Plateau	Variable	Yes
RD 4	Area-based integrated rural development	Variable	Case by case
<b>10. Irrigation</b>			
I 1	Community managed irrigation Phase 2 (CMI-2)	Variable	Case by case
I 4	Accelerated irrigation management transfer (IMT) development study	Neutral	No
I 5	Community managed small-scale irrigation	Variable	Case by case
I 11	Flood disaster mitigation	Positive	No

As is demonstrated in Table 8.1, it is anticipated that from the initial environmental screening process, most (75% or more) of the proposed programs and projects in the M/P study will not require an IEE. Once projects and programs are area specific, then a more exact screening can occur.

For new arable, pastoral and mixed farming projects or projects based on the exploitation of non-timber forest products (NTFP) IEE's and EIA's could be required in the following specific areas where projects are proposed.

- (a) In conservation/protection areas or in islands of important forest types.
- (b) In areas of religious or historic significance.
- (c) Where significant or unique forest areas are to be converted to farming.
- (d) Where NTFPs are to be developed or expanded from the natural forests.
- (e) In important wetland areas and for significant irrigation schemes.

- (f) Where the use of agro-chemicals, insecticides and pesticides is proposed.
- (g) Where more than 25 buildings (or villages) are to be removed or relocated.
- (h) For infrastructural programs supporting agricultural development such as new roads, dam construction, various buildings etc.

## **CHAPTER 9 IMPLEMENTATION PLAN TOWARDS YEAR 2010**

### **9.1 Development Goal as a Basis for Prioritization**

In the Phase II of the Study, assessment of ranking of projects are carried out for being taken up either before 2010 or from 2011-2020. On this basis, the report listed 58 programs/projects to be taken up before 2010 and 44 from 2011-2020 and classified 8 projects as on-going. Further work and review has been done on the projects and programs as well as prioritization and sequencing. A set of criteria as well as a points system has been introduced. After further review, some of these programs/projects have been combined and each project was individually evaluated and a point score given to each project/program to assess its priority.

Programs/projects listed in the Action Plan would impact differently in terms of their net impact on value added (GDP). It is also likely that the number of projects and programs listed may be in excess of the resource envelope (from revenue and donor assistance) for the sector. This was the underlying rationale for prioritization. In addition, there was a need for some sequencing in project commencement and this was also done. Not all criteria selected are readily quantifiable but a non-quantitative assessment was made in where this was not possible.

There are several criteria that could be employed in an analysis such as this. However, as this is a long term Action Plan, the selection of criteria for prioritization was directly related to the overall goal or target. The primary target as stated in the Strategic Vision for Agriculture is for Lao PDR to graduate from a least developed country status by 2020 by achieving a per capita income of US\$ 885 in 2000 constant prices. While other criteria such as the impact on employment creation and on rural development may be important considerations, they played a less important role in the light of this goal.

As agriculture is the largest sector contributing over 50% of GDP in 2000, the most important criterion for the prioritization of programs/projects would be the net impact on value added. While the Economic Rate of Return (ERR) would be a good indicator, it is not possible to estimate the ERR for all projects listed here. However, it is possible to make some estimation of the net impact on value added through some estimation of direct (or indirect) contributions to net production increase.

The Study Team undertook a review of the human resource capacity and other indicators of implementation capacity in the provinces and districts. The Study Team concluded that project implementation capacity, particularly in PAFS and



DAFO is a critical factor. The staffing as well as the other facilities at the provincial and district level is important due to the governments' policy on decentralization and the increasing share of the PIP being allocated directly to the provinces. In order to assess this criterion, a standard checklist and a points score system was prepared and each project was given a point score to evaluate its implementation capacity.

**Table 9.1 Evaluation Criteria and Scoring for Implementing Capacity**

Evaluation Item	Scoring		
	Point 1	Point 2	Point 3
1. Project Implementation by Public Sector Agency			
2. Project Implementation by Donor /NGO			
3. MAF's Direct Involvement in Implementation			
4. Adequacy of Planning staff in PAFO offices			
5. Additional staff required in MAF/PAFO to Implement Project			
6. Is training required for present staff to implement Project			
7. PIP flow of funds adequacy and budgetary process			
8. Provincial flow of recurrent funds and budget process			
9. Adequacy of funds by PAFS for project expenses e.g. per diem			
10. Vehicle Adequacy for Project Implementation-4WD, m/cycles			
11. Adequacy of Office facilities – space, equipment, computers			
12. Adequacy of communication networks-telephone, fax, email			
Sub-Total			
<b>Total Score =</b>			<b>Points</b>

While the net impact on value added is an important criterion in the light of the overall objective of increasing per capita income, it does not take into account the timing of the returns. In other words, a program/project could have a high net impact on value added but due to the gestation period, the returns could be delayed. For example, an agroforestry project could take 8-10 years to realize full potential returns while a fish fingerling production project could yield returns on investment in a year. The relative project costs and timing of outputs is included as a criterion.

In view of the long time horizon of the Action Plan (18 years) it is not only necessary to aim for a net increase in value added but also provide for an adequate resource base to ensure that the net impact on value added continues over the whole period. It is therefore necessary to ensure that there are some project activities that sustain the growth over the period of the Action Plan. These project/programs are referred to as foundation building investments and are projects that provide the basis for further production of net value added over the life of the Action Plan.

Examples of some such activities are breeding and foundation seeds and seed multiplication, extension trainer training, fish fingerling production programs and animal health.

A review of investments as reflected in the Public Investment Program shows a sub-sectoral imbalance. Sub-sectors such as livestock, fisheries and agroforestry have received a low proportion of investment expenditure, far lower than their respective contributions to GDP. Irrigation and forestry have received a very high proportion of investment funds. This was highlighted in several recent studies. In addition, it was noted that investments in animal health programs, fish fingerling production and agroforestry activities can provide quick and high returns. It is therefore necessary to give priority to projects that show a high return in sub sectors that have not received a reasonable level of investment in recent years.

Many programs/projects listed here need to be implemented in unison with other program to realize their full potential. For example, an adaptive research project for an export crop should be sequenced to follow a research project for the same export crop so that the benefit of the research could be applied to the adaptive trials. Project to project inter dependency should, therefore, be given due consideration in sequencing and prioritization.

The point score was assigned to all projects and programs to be taken up before 2010. Project profiles were also prepared for each of these programs/projects and are in Volume II: Project Profiles. The results of the point score system provide a list of the priorities and the sequencing. In many cases, projects have a similar point score.

**Table 9.2 Evaluation Criteria and Scoring for Prioritization**

Evaluation Criteria	Evaluating Scoring				
	Point 1	Point 2	Point 3	Point 4	Point 5
1. Direct Impact on Value Added (GDP)					
2. Implementing Capacity of agency/ies (from Implementing capacity worksheet)					
3. Relative Project Costs and Timing of Outputs					
4. Emphasis on Investment Deepening e.g. trainer training, extension, breeder seed etc					
5. Sub sector imbalance & high return ( $\leq 3$ in 1)					
6. Project to Project Interdependency					
7. Employment Creation/Rural development					
Sub-Total					
<b>Total Score =</b>				<b>Points</b>	

Note: 1) 1 is lowest and 5 is highest.

## **9.2 Results of the Prioritization and Sequencing of Projects and Programs**

### **9.2.1 Introduction**

In discussions with the Ministry of Agriculture and in the Central Workshops the Study team pointed out that agriculture projects tend to be more area specific due to agronomic conditions and that there is a need to take a more regional approach to project implementation and priorities particularly in view of considerations such as comparative advantage and the poor infrastructure in the country. There was also a need to recognize that the project profiles prepared and included in this report are only at the identification stage and much more work is required in project design and strategy, formulation, targets and components before these projects could reach implementation stage. In view of the 18 year time horizon, it was also necessary to recognize that the overall priorities and relative importance of projects would change over time depending on developments in other sectors of the economy and the regional trading pattern. Above all, the Government was still in the process of drafting the next Five Year Plan for Agriculture and the targets and objectives in the Plan need to be worked into the prioritization as presented in this report.

It is therefore recommended that the approach to be taken by Government is to follow the priorities presented in this report as the major indicators for reaching the overarching economic goal for the country. Agriculture sector projects and priorities need to be formulated within this overall priority framework as presented here. However, in the formulation of projects and programs for agriculture, whether nationally or regionally, due adjustments and modifications would need to be made to meet the specific objectives and needs pursued for the agriculture sector.

The results of the prioritization are presented in this section. The strategy for implementation is to initially take projects and programs currently having the capacity to implement; yield a very quick return on the investment; have a low cost to return ratio and have a quick impact on value added. This should be combined with a mix of critical areas of foundation investment.

### **9.2.2 Result of Priority by Scoring Evaluation**

Table 9.3 presents the result of prioritization of projects and programs by the scoring evaluation method as shown in Table 9.2. The projects and programs of 58 in number are classified largely into four groups as presented in Table 9.3, and the 1st through 3rd groups, including 22 projects and programs, are evaluated as having more than 60% score. The features of the respective groups are described below.

### (1) First Group

The first group of eleven projects is in the sub-sectors of fisheries, livestock, non-timber forest products (NTFP), seed multiplication, horticulture and rural finance. These projects stand out as high priority activities because these could be implemented almost immediately, have a significant impact on value added, provide additional income and create employment opportunities for farm families.

The fisheries sector has not received sufficient budget allocation and investment requirements are relatively low, it is quick yielding and the return relatively high. The budgetary allocation for the fisheries sub-sector in 2000/01 was only 4% of the budget for all livestock. The Aquaculture Improvement and Extension Project, the Fish Seed Center Rehabilitation/Extension Project and the Rural Aquaculture (reservoirs and dams) Development Project rank as high priority as they have the implementation capacity and it is proposed that these projects be commenced as early as possible. These projects would also assist in supplementing family income and provide supplementary protein intake and thereby also assist from the nutritional point of view. These projects would also help reduce imports especially in provinces such as Xaignabouri. Several donor-assisted projects have already provided foundation investment for aquaculture that could be built on and as Lao PDR is landlocked, there is a very good additional reason for supporting aquaculture activities as a matter of priority.

In livestock sector, animal health is also a high priority due to the high level of mortality especially among poultry but this activity is also important in view of present potential for export and the need to conform to international health and quarantine standards in export. Two projects, namely the Animal Health Improvement Project and the Animal Health Center Improvement Project are listed as high priority. Many donor assisted projects have recently been completed but are mainly area specific. The mortality rate from ordinary and epidemic disease is high and farmer knowledge of epidemic disease is low. There is a need for a wider coverage of animal health activities. Data available for 2000 indicate that only 22% of buffalo and cattle, 9% of pigs and 19% of poultry were vaccinated. The low percentage implies that the full impact of animal health services is not likely to be realized due to externality losses. Adequate animal health measures are important as all farm families also have livestock (which is the primary source of family savings) and are an important source of family income. With rising incomes, the domestic demand for livestock products is growing rapidly and the potential for export is also relatively high as indicated by the large unrecorded border trade. It is also important from the nutritional point of view as it supplements the protein

intake of the population. Additionally, the organizational network of the VVW could be expanded to provide the service at low public sector cost. Overall, the high return on the relatively low level of investment in animal health warrants an early commencement of a rapid expansion of animal health services through the VVW system

Another activity that has been accorded high priority is non-forest timber products (NTFP). The Research and Sustainable Management and Utilization of NTFP Project and the associated project on Processing and Marketing of NTFP are accorded high priority. This activity provides a high degree of supplementary income (and food) to farm families and exports have registered rapid increase. The potential for expansion is good but there is a need to address many issues relating to the extraction and management of the resource as well as maximizing the returns from this activity in a sustainable manner. This is an activity that needs more attention and could yield high returns and export income at very low cost.

Quality seed production for rice and other crops are also accorded high priority. While the implementation capacity is relatively low, there is potential for low cost and high return from this activity. Research by IRRI has shown that improved paddy seed alone (without any other technical improvements) could result in yield increases of over to 10%. The Rice Seed Multiplication Project could be commenced now while the Basic Seed Production Technology Project should commence at early stage.

Expansion of Micro-finance Activities is accorded high priority. Micro-finance activities through the formation of micro-finance institutions (MFI's) are now gaining ground in two provinces under a donor-assisted project. Only 10% of the rural population has access to institutional credit and it is unlikely that the financial institutions (APB and SOCB's) could expand their activities for several years to come. Market garden development is also important and high priority is accorded to the Outer City Horticulture Program to enable rapid increase in production of higher value horticultural products for the rapidly growing urban markets and for export. This activity also assists in supplementing income of rural farm families.

## (2) Second Group

The next group of five projects relates also to increasing farm incomes but rank lower priority because of the emphasis on adaptive research and "learning by doing" which normally takes more time. The On-Farm Agro forestry Project for Sustainable Upland Farming Systems, the Crop Diversification Project, the Fruit

and Vegetable Cultivation Technology Research Projects and the Sericulture Project are all adaptive research projects aimed at demonstrations and hands on training of farmers on farmers fields with introduction of new technologies, new varieties and improved farming practices. The On-Farm Agro forestry project would also provide an additional source of income to farm families and aim to stabilize shifting cultivation. Most of other programs would draw on already proven research results in Lao and neighboring countries. The Sericulture Project is also included to increase incomes of farm families through expansion of production of cocoon and silk and provide a boost to improving the facilities for quality improvement and training of farmers.

### (3) Third Group

The next group of projects is mainly research projects relating to coffee cultivation, upland crops, export oriented crops, a project for setting up a Commodity Market Intelligence Network and a project for Community Managed Small Scale Irrigation systems. The research activities have not been ranked high mainly because of the time lag between activity and results and the lack of implementing capacity of these groups of projects. These projects are nevertheless important for longer-term development of agriculture in Lao PDR. It needs to be stressed that research activities that are important such as adaptive research in selected areas have been identified and pursued selectively rather than by adopting a broad brush approach. This is due to the high cost and long gestation period of research activities.

### (4) Fourth Group

The above three groups score more than 60% of full marks. The next group of projects in order of priority is less than 60%. This group includes stabilizing of shifting agriculture, rural development projects with emphasis on agriculture, flood disaster mitigation and rural credit. The organization and management of agriculture and improvements to MAF planning and statistics, human resource development, staff training, strengthening of the research capacity are all ranked as priority although the priority rating is lower due to the long gestation period and the relatively high cost. This also applies to the range of human resource development projects such as in-service training, training of provincial and district staff, training of extension staff and of farmers. The results of the prioritization and a list of the priority grouping of the projects is in the attached table.

**Table 9.3 (1/2) Prioritization of Projects/Programs in Action Plan**

<b><u>Priority 1</u></b>		
1.	LF-10	Aquaculture Improvement and Extension Project
2.	LF-11	Fish Seed Center Rehabilitation/Expansion Project
3.	LF-2	Animal Health and Quarantine Improvement
4.	RF-11	Expansion of Micro Finance Activities
5.	LF-12	Rural Aquaculture Development Project
6.	SC-4	Research Project on Sustainable Management and Utilization of NTFPs
7.	AC-5	Outer City Horticulture Promotion Program
8.	AC-1	Rice Seed Multiplication Improvement Project
9.	MR-8	Processing and Marketing of NTFP
10.	AC-21	Basic Seed Production Technology Development Project
11.	LF-6	National Animal Health Center Improvement
<b><u>Priority 2</u></b>		
12.	SC-3	On-farm Agro-forestry Adaptive Research for Sustainable Upland Farming Systems
13.	AC-4	Crop Diversification Program
14.	AC-10	Sericulture Development Project
15.	AC-16	Fruit Cultivation Technology Research Program
16.	AC-15	Vegetable Cultivation Technology Research Program
<b><u>Priority 3</u></b>		
17.	MR-2	Agricultural Commodity Market Intelligence Project
18.	AC-14	Coffee Cultivation Technology Research Program
19.	AC-22	Upland Crop Cultivation Technology Research Program
20.	AC-7	Export Oriented Crop Promotion Program
21.	IR-5	Community Managed Small Scale Irrigation Management Project
22.	RF-8	Expansion of Credit to Farmer Groups by APB
<b><u>Priority 4</u></b>		
23.	IR-4	TA for Accelerated Irrigation Management Transfer
24.	RD-3	Integrated Agriculture and Rural Development in Boloven Plateau
25.	RD-1	Village-led Agriculture Development Initiative in Remote Rural Area (VADIRRA)
26.	AC-8	Fruit Crop Promotion Program in Northern Region
27.	AC-9	Fruit Crops promotion Program in Southern Areas
28.	RF-1	In-service Training of SOCB Staff and Expansion of the Training Center
29.	AC-12	Farming Technology Dissemination Project
30.	HR-2	Development of District In-Service Training and Farmer Training in Agriculture and Forestry
31.	RF-9	APB Restructuring and Reorganization on the Recommendations of Diagnostic Study
32.	SC1.2	Stabilization of Shifting Cultivation in the Northern Region
33.	HR-4	Irrigation Technician School Improvement Project
34.	SC1.1	Stabilization of Shifting Cultivation in the Southern Region
35.	IR-1	Community Managed Irrigation Sector Project-2 (CMISP-2)
36.	RF-2	SOCB Operational Performance and Extension of Rural Banking
37.	IO-1.1	Strengthening of MAF Management and Administration
38.	MR-9	Wholesale Market Development Project
39.	LW-1	Strengthening Land Use Planning (LUP) & Land Allocation (LA) and Land Titling in Rural Area
40.	IR-11	Flood Disaster Mitigation
41.	HR-4	Strengthening Agriculture and Forestry Technical Education Capacity

(Table continued)

**Table 9.3 (2/2) Prioritization of Projects/Programs in Action Plan**

42.	IO-1.3	Strengthening of MAF Human Resource Management
43.	IO-1.2	Strengthening of MAF Planning and Statistical Capacity
44.	LF-5	Livestock Productivity Enhancement Program
45.	RD-4	Area-based Integrated Rural Development Program
46.	SC-1.3	Upland Development and Poverty Alleviation Program
47.	IO-4.2	NAFRI Staff Capacity Building Project
48.	IO4.1	NAFRI Institutional Strengthening
49.	IO4.3	NAFRI Research Upgrading Project
50.	SC-2	Stabilization of Shifting Cultivation in National Bio-diversity Conservation Areas (NBCAs)
51.	HR-6	Program for strengthening the Capacity of University Education in Agriculture and Forestry
52.	HR-1	Strengthening Agriculture & Forestry Extension Services
53.	LW-4	Agro-Zone Land Classification, Land Management & Farming Systems Development
54.	IO-6	Plant Quarantine Strengthening Project
55.	LW-3	Watershed Management Program
56.	MR-7	Study of Export Potential and Input Imports of Agricultural Commodities
57.	LW-7	Rehabilitation and Expansion of Meteo-hydrological Station for Agriculture Development and Flood Control
58.	MR-4	Agriculture Products Grade and Classification Project

### 9.2.3 Prioritization on Area-based Agricultural and Rural Development Approach

Apart from the overall prioritization of projects and programs evaluated by scoring method as discussed in Section 9.2.2, these are classified by the areas as defined in Section 5.5 “Area based Agricultural and Rural Development Approaches”. The selection of projects and programs on an area basis is based on the development direction for the respective four areas, i.e. (i) northern upland and highland areas, (ii) Vientiane plain, (iii) central and southern areas, and (iv) Boloven plateau, and also based on assessment of target areas of all the projects and programs given in Volume II “Profiles of Priority Projects and Programs”. The result of area-based prioritization is presented in Table 9.4.

### 9.2.4 Prioritization on Sub-sector-based Approach

The projects and programs are classified by the sub-sectors with prioritization as shown in Table 9.5. This classification will be useful reference for decision making in selection and implementation of projects and programs by the MAF’s respective departments and other government’s agencies concerned. However, this classification and prioritization have to be read in conjunction with the overall prioritization discussed in Section 9.2.2 and Table 9.3.



**Table 9.4 Priority Projects and Programs by Area (1/2)**

<b>Whole Lao Country</b>		
1	LF-2	Animal Health Improvement
2	AC-22	Basic Seed Production Technology Project
3	AC-11	Sericulture Development Project
4	LF-6	National Animal Health Center Improvement Project
5	RF-8	APB expansion of credit to Farmers
6	AC-23	Upland Crop Cultivation Technology Research Project
7	RF-1	Training of Bank Staff and expansion of Training Center
8	AC-13	Farming Technology Dissemination Project
9	RF-9	APB Restructuring and Reorganization
10	HR-4	Irrigation Technician School Improvement
11	HR-2	Development of District In-Service Training and Farmer Training
12	RF-2	Improvement of SOCB Operational Performance and Branch Expansion
13	IO-1.1	Strengthening Administration and Management Procedures of MAF
14	HR-3	Strengthening Capacity of Technical Education in Agriculture and Forestry
15	LF-5	Livestock Productivity Enhancement
16	IO-1.2	Strengthening Planning and Statistical Capacity of MAF
17	IO-1.3	Strengthening Human Resource Management of MAF
18	IO-4.1	NAFRI Institutional Strengthening and Restructuring Project
19	IO-4.2	NAFRI Staff Capacity Building Project
20	IO-4.3	NAFRI Research Upgrading Project
21	HR-5	Strengthening Capacity of University Education in Agriculture and Forestry
22	HR-1	Strengthening Agriculture & Forestry Extension Services
23	LW-4	Agro-Zone Classification, Land Management and Farming System Development
24	IO-6	Plant Quarantine Strengthening Project
25	LW-3	Watershed Management Program
26	LW-7	Strengthening Weather forecasting System
27	MR-4	Agricultural Products Grade and Classification Project
<b>Whole Northern Upland and Highland Areas</b>		
1	RF-11	Expansion of Microfinance Activities
2	SC-5	Research on Sustainable Management and Utilisation of NTFPs
3	SC-3	On-Farm Agroforestry Research for Sustainable Upland Farming System
4	MR-8	Processing and Marketing of NTFPs
5	AC-17	Fruit Cultivation Technology Research Program
6	AC-9	Fruit Crops Promotion in Northern Region
7	RD-1	Village Initiative Agriculture Development in Remote Rural Areas
8	SC-1.1	Stabilisation of Shifting Cultivation in Southern Region
9	LW-1	Follow-up Activities: Quality Improvement in Land Use Planning & Land Allocation and Land Titling in Rural Area
10	SC-1.3	Upland Development and Poverty Alleviation Program
11	SC-2	Stabilisation of Slash and Burn inside NBCAs
<b>Northern Upland and Highland Areas/Lowland Upland Sub-Area</b>		
1	LF-10	Aquaculture Improvement and Extension Project
2	LF-11	Fish Seed Center
3	LF-12	Rural Aquacultural Development
4	AC-1	Rice Seed Multiplication Improvement
5	MR-2	Agricultural Commodity Market Intelligence System
6	IR-5	Community Managed Small Scale Irrigation and Management Project
7	IR-4	TA for Accelerated IMT Development
8	IR-1	Community Managed Irrigation Sector Project
9	MR-9	Wholesale Market Development Project
<b>Northern Upland and Highland Areas/Sparsely Populated Remote Sub-Area</b>		
1	RD-4	Area Based Integrated Rural Development program
<b>Northern Upland and Highland Areas/Sparsely Populated Remote Sub-Area</b>		
1	AC-16	Vegetable Cultivation Technology Research Program
2	MR-2	Agricultural Commodity Market Intelligence System
3	AC-8	Export Oriented Crop Promotion
4	MR-7	Study of the Export Potential and Input Import of Agriculture Commodities

**Table 9.4 Priority Projects and Programs by Area (2/2)**

<b>Vientiane Plain</b>		
1	LF-10	Aquaculture Improvement and Extension Project
2	LF-11	Fish Seed Center
3	LF-12	Rural Aquacultural Development
4	AC-6	Outer City Horticultur Promotion Program
5	AC-1	Rice Seed Multiplication Improvement
6	AC-16	Vegetable Cultivation Technology Research Program
7	MR-2	Agricultural Commodity Market Intelligence System
8	IR-5	Community Managed Small Scale Irrigation and Management Project
9	IR-4	TA for Accelerated IMT Development
10	IR-1	Community Managed Irrigation Sector Project
11	MR-9	Wholesale Market Development Project
12	IR-11	Flood Disaster Mitigation
<b>Whole Central and Southern Area</b>		
1	RF-11	Expansion of Microfinance Activities
2	RD-1	Village Initiative Agriculture Development in Remote Rural Areas
<b>Central and Southern Area/Mekong Corridor Sub-Area</b>		
1	LF-10	Aquaculture Improvement and Extension Project
2	LF-11	Fish Seed Center
3	LF-12	Rural Aquacultural Development
4	AC-1	Rice Seed Multiplication Improvement
5	AC-5	Crop Diversification Program
6	AC-16	Vegetable Cultivation Technology Research Program
7	MR-2	Agricultural Commodity Market Intelligence System
8	IR-5	Community Managed Small Scale Irrigation and Management Project
9	IR-4	TA for Accelerated IMT Development
10	IR-1	Community Managed Irrigation Sector Project
11	MR-9	Wholesale Market Development Project
12	IR-11	Flood Disaster Mitigation
<b>Central and Southern Area/Upland and Highland Sub-Area</b>		
1	SC-5	Reserch on Sustainable Management and Utilisation of NTFPs
2	SC-3	On-Farm Agroforestry Research for Sustainable Upland Farming System
3	MR-8	Processing and Marketing of NTFPs
4	AC-17	Fruit Cultivation Technology Research Program
5	AC-10	Fruit Crops promotion in Southern Region
6	SC-1.2	Stabilisation of Shifting Cultivation in Northern Region
7	LW-1	Follow-up Activities: Quality Improvement in Land Use Planning & Land Allocation and Land Titling in Rural Area
8	SC-1.3	Upland Development and Poverty Alleviation Program
9	RD-4	Area Based Integrated Rural Development program
10	SC-2	Stabilisation of Slash and Burn inside NBCAs
<b>Boloven Plateau</b>		
1	AC-16	Vegetable Cultivation Technology Research Program
2	MR-2	Agricultural Commodity Market Intelligence System
3	AC-15	Coffee Cultivation Technology Research Program
4	RD-3	Integrated Agriculture and Rural Development in Boloven Plateau
5	MR-9	Wholesale Market Development Project

**Table 9.5 Priority Projects and Programs by Sub-Sectors**

<b>Common Agriculture Sector (Institutinal, Human Resouces and Rural Development)</b>		
1	RD-3	Integrated Agriculture and Rural Development in Boloven Plateau
2	RD-1	Village Initiative Agriculture Development in Remote Rural Areas
3	HR-2	Development of District In-Service Training and Farmer Training
4	IO-1.1	Strengthening Administration and Management Procedures of MAF
5	HR-3	Strengthening Capacity of Technical Education in Agriculture and Forestry
6	IO-1.2	Strengthening Planning and Statistical Capacity of MAF
7	IO-1.3	Strengthening Human Resource Management of MAF
8	RD-4	Area Based Integrated Rural Development program
9	HR-1	Strengthening Agriculture & Forestry Extension Services
<b>Livestock &amp; Fishery Sub-Sector</b>		
1	LF-10	Aquaculture Improvement and Extension Project
2	LF-11	Fish Seed Center
3	LF-2	Animal Health Improvement
4	LF-12	Rural Aquacultural Development
5	LF-6	National Animal Health Center Improvement Project
6	LF-5	Livestock Productivity Enhancement
<b>Metrology and Hydrology Sub-Sector</b>		
1	LW-7	Strengthening Weather forecasting System
<b>Irrigation Sub-Sector</b>		
1	IR-5	Community Managed Small Scale Irrigation and Management Project
2	IR-4	TA for Accelerated IMT Development
3	HR-4	Irrigation Technician School Improvement
4	IR-1	Community Managed Irrigation Sector Project
5	IR-11	Flood Disaster Mitigation
<b>Forestry Sub-Sector</b>		
1	MR-8	Processing and Marketing of NTFPs
2	SC-1.2	Stabilisation of Shifting Cultivation in Northern Region
3	SC-1.1	Stabilisation of Shifting Cultivation in Southern Region
4	LW-1	Follow-up Activities: Quality Improvement in Land Use Planning & Land Allocation and Land Titling in Rural Area
5	SC-1.3	Upland Development and Poverty Alleviation Program
6	SC-2	Stabilisation of Slash and Burn inside NBCAs
7	LW-3	Watershed Management Program
<b>Crop Sub-Sector</b>		
1	AC-6	Outer City Horticultur Promotion Program
2	AC-1	Rice Seed Multiplication Improvement
3	AC-5	Crop Diversification Program
4	AC-11	Sericulture Development Project
5	MR-2	Agricultural Commodity Market Intelligence System
6	AC-8	Export Oriented Crop Promotion
7	AC-9	Fruit Crops Promotion in Northern Region
8	AC-10	Fruit Crops promotion in Southern Region
9	AC-13	Farming Technology Dissemination Project
10	IO-6	Plant Quarantine Strengthening Project
11	MR-7	Study of the Export Potential and Input Import of Agriculture Commodities
12	MR-4	Agricultural Products Grade and Classification Project
<b>Agricultural Research Sub-Sector</b>		
1	SC-5	Reserch on Sustainable Management and Utilisation of NTFPs
2	SC-3	On-Farm Agroforestry Research for Sustainable Upland Farming System
3	AC-22	Basic Seed Production Technology Project
4	AC-16	Vegetable Cultivation Technology Research Program
5	AC-17	Fruit Cultivation Technology Research Program
6	AC-15	Coffeee Cultivation Technology Research Program
7	AC-23	Upland Crop Cultivation Technology Research Project
8	IO-4.1	NAFRI Institutional Strengthening and Restructuring Project
9	IO-4.2	NAFRI Staff Capacity Building Project
10	IO-4.3	NAFRI Research Upgrading Project
11	LW-4	Agro-Zone Classification, Land Management and Farming System Development
<b>Other Sectors</b>		
1	RF-11	Expansion of Microfinance Activities
2	RF-8	APB expansion of credit to Farmers

### 9.3 Financing of the Action Plan

The actual budgetary expenditure for the Ministry of Agriculture and Fisheries from 1995-96 to 1999-2000 and the planned expenditure in 2001-2000 were obtained from MAF and are presented below:

**Table 9.6 MAF Budget Data (Actual 1995-96 to 1999-2000) and Planned 2001-2002**

(Unit: billion kip)

Fiscal Year	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001
Capital	2260.19	1589.17	1573.24	2500.00	2500.00	5200.00
Recurrent	1191.99	1389.77	1308.20	2302.89	3076.55	4484.74
Total	3452.18	2978.94	2881.44	4802.89	5576.55	9687.74

Source: MAF

The above table only includes data for MAF. The budgetary expenditure and allocations for the provinces and districts for the agriculture and forestry sub-sectors are not known to MAF. MAF Planning Department did not have access to provincial data since the decentralization process commenced. The Study Team was informed that a start has been made to collect provincial budget data for the most recent years. Availability of this information would have permitted a detailed analysis of the budget envelope for both the capital and recurrent budget in future years under the Action Plan.

Actual and planned expenditure and budget resources for agriculture under the Public Investment Program (PIP) is available from the Government report to the 7th Roundtable Meeting (November 2000) as is seen in the following table:

**Table 9.7 Actual and Planned PIP Total and Agriculture 1995/96 to 2002/2003**

(Unit: billion kip)

Fiscal Year	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
	Actual	Actual	Actual	Actual	Actual	Planned	Planned	Planned
PIP Total	205.4	264.4	589.6	908.0	1701.0	2005.0	2500.0	2800.0
Agriculture	23.4	34.0	128.9	120.0	213.0	470.0	475.0	504.0
Agriculture %	11.4%	12.9%	21.9%	13.2%	12.5%	23.4%	19.0%	18.0%

Note: Data in above table is in current values and are not comparable with estimated resource availability in Chapter 5.

Source: Government Report to 7<sup>th</sup> Roundtable Meeting, November, 2000

A feature of the above table is that although the Medium Term Expenditure Framework targeted 18% of PIP for agriculture, the proportion received by the agriculture sector has been substantially larger in both 1997-98 and 2000-01. Discussions with the Planning Department of MAF indicate that the budget planning process for 2001-2002 is now underway and the guidelines issued for budget preparation is for an increase in the agriculture PIP for MAF of 30% over 2000-2001 in current values. It was indicated that the provincial share of PIP is set

at 70% and the MAF share at 30% and the proposed increase would be of the same magnitude. The planned PIP for agriculture in 2001-2002 would be 470 billion kip plus 30% less forestry. This is derived as 603 million kip in current values.

It is assumed that future PIP allocations to agriculture would be increased by 18% per annum in current values, that is lower than the rate of increase in 2000/01 and 2001/02 but is the average for recent years. In addition, following discussions with MAF Planning Department staff it is assumed that 15% of the agriculture PIP for each year would be uncommitted. This is because there is a large proportion of donor assisted projects included in the PIP and these projects, on average, have a life of five years. Both the annual increment to the PIP and the uncommitted share of the PIP in constant values are assumed to be available each year for new project/program activities. On this basis, the annual budgetary funds available for financing the Action Plan activities are shown in the following Table.

**Table 9.8 Agriculture Sector Investment Projection 2002/03 to 2009/10**

(Unit: billion kip constant terms)

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
1. Agriculture	712	840	991	1,169	1,379	1,628	1,921	2,267
2. Adjustment for Constant terms	651	703	760	820	886	957	1,033	1,116
3. Increase Year on year	48	52	57	60	66	71	76	83
4. Uncommitted PIP for New Activities	98	105	114	123	133	144	155	167
5. TOTAL (3&4)	146	157	171	183	199	215	231	250
6. US \$ Million	17.8	19.1	20.0	22.3	24.2	26.2	28.1	30.4
7. Capital Expenditure	14.2	15.3	10.0	11.15	12.1	13.1	14.05	15.2
8. Recurrent Expenditure	3.6	3.8	10.0	11.15	12.1	13.1	14.05	15.2

- Note: i) Assumed increase in PIP for Agriculture sector excluding forestry of 18% a year in current terms.  
 ii) Conversion to constant terms assuming inflation rate of 8% per annum  
 iii) Capital Expenditure assumed as 80% of PIP for 2002/03 and 2003/04 and 50% thereafter  
 iv) US \$ to Kip is at US\$1=8220 kip  
 v) Assumes all increase in PIP is assigned to new projects and programs in Action Plan  
 iv) Assumption that 15% of PIP each year is uncommitted and assigned to new projects/.programs.

The budgetary resource availability is now compared with the preliminary costs of the priority projects and programs. This is to provide some broad indication of the extent to which resources are likely to be available for the projects and programs. The table below gives preliminary cost estimates for the group of priority 1, priority 2 and priority 3 projects/programs (Total of the 22 highest priority projects). These costs are preliminary and need to be revised when more detailed project formulation and preparation is undertaken. However, based on the assumptions made for the resource availability, it appears that between 16 to 22 of the highest priority

programs could be commenced based on the estimate of resource availability in the PIP.

However, as donors meet over 80% of the PIP for any year, it is likely that donors would have their own criteria for aid disbursement. Donors have shown a preference for new projects for funding. Past experience indicates that Lao PDR has not been able to realize targets in public investment on a sub-sector basis, although the total PIP targets have been more than met. It is therefore recommended that (i) after acceptance and distribution of the Action Plan, Government convenes a series of meetings with donors to outline priorities and implementation issues; (ii) issue new guidelines on donor financing to ensure that the priority projects and programs are taken up by donors; and (iii) that donors also fund recurrent expenditure.

**Table 9.9 Annual Capital and Recurrent Cost of Priority Projects and Programs**

(Unit: 1

			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
<b>Priority 1</b>									
LF-10	Aquaculture Improve & Extension Project	Capital	1,256	450	450	1,125	450	450	450
		Recurrent	88	64	64	84	64	64	64
LF-11	Fish Seed Center Extension/Rehabilitation Project	Capital	5,060	360	360	360	360	6,500	
		Recurrent	193	52	52	52	52	401	
LF-12	Rural Aquaculture Development Project	Capital	690	690	690	1,890	1,890	1,890	270
		Recurrent	124	124	124	160	160	160	111
LF-2	Animal Health and Quarantine Improvement Project	Capital							
		Recurrent							
SC-4	Research Project on Sustainable Management and Utilization of NTFPs	Capital	441	270	0	441	270	0	441
		Recurrent	24	18	10	24	18	10	24
AC-5	Outer City Horticulture Promotion Project	Capital		915	780	780	780	780	780
		Recurrent		233	229	229	229	229	229
RF-11	Expansion of Micro Finance Activities	Capital				915	780	780	780
		Recurrent				233	229	229	229
AC-1	Rice Seed Multiplication Improvement Project	Capital	1,000	3,285	285	285	285	1,380	6,480
		Recurrent	40	176	86	86	86	124	267
MR-8	Processing and Marketing of NTFP	Capital	255	165	165	150	150	150	150
		Recurrent	69	67	67	66	66	66	66
AC-22	Basic Seed Production Technology Development Project	Capital		848	348	348	348	348	
		Recurrent		259	237	237	237	237	
LF-6	National Animal Health Center Improvement	Capital			1,390	1,390	890	390	390
		Recurrent			42	93	78	63	63
<b>Total of Priority 1</b>			<b>Capital</b>	<b>8,702</b>	<b>6,983</b>	<b>4,468</b>	<b>7,684</b>	<b>6,203</b>	<b>12,668</b>
			<b>Recurrent</b>	<b>538</b>	<b>993</b>	<b>911</b>	<b>1,264</b>	<b>1,219</b>	<b>1,583</b>
<b>Priority 2</b>									
SC-3	On-farm Agro-forestry Adaptive Research for Sustainable Upland Farming Systems	Capital					340	240	240
		Recurrent					165	162	162
AC-5	Crop Diversification Program	Capital					880	790	382
		Recurrent					118	209	197
AC-10	Sericulture Development Project	Capital		528	1,828	693	628	578	622
		Recurrent		311	438	701	699	401	853
AC-16	Fruits Cultivation Technology Research Program	Capital				921	821	281	281
		Recurrent				188	179	163	163
AC-15	Vegetable Cultivation Technology Research Program	Capital			921	821	281	281	1,781
		Recurrent			188	179	163	163	208
<b>Total of Priority 2</b>			<b>Capital</b>	<b>0</b>	<b>528</b>	<b>2,749</b>	<b>2,435</b>	<b>2,950</b>	<b>3,306</b>
			<b>Recurrent</b>	<b>0</b>	<b>311</b>	<b>626</b>	<b>1,068</b>	<b>1,324</b>	<b>1,583</b>
<b>Priority 3</b>									
MR-2	Agricultural Commodity Market Intelligence Project	Capital	300	280	240	240	240		
		Recurrent	205	153	121	69	69		
AC-14	Coffee Cultivation Technology Research Program	Capital			668	1,528	416	408	408
		Recurrent			253	280	255	254	254
AC-22	Upland Crop Cultivation Technology Research Program	Capital				646	316	276	276
		Recurrent				179	164	163	163
AC-7	Export Oriented Crop Promotion Program	Capital			900	853	603	374	275
		Recurrent			45	293	286	279	276
IR-5	Community Managed Small Scale Irrigation Management Project	Capital			2,522	2,585	2,553	2,490	2,490
		Recurrent			595	596	597	594	606
RF-8	Expansion of Credit to Farmer Groups by APB	Capital							
		Recurrent							
<b>Total</b>			<b>Capital</b>	<b>300</b>	<b>280</b>	<b>4,330</b>	<b>5,852</b>	<b>4,128</b>	<b>3,548</b>
			<b>Recurrent</b>	<b>205</b>	<b>153</b>	<b>1,014</b>	<b>1,417</b>	<b>1,371</b>	<b>1,299</b>

Costing of priority projects based on sequencing and on priority rating of projects

## CHAPTER 10 CONCLUSION AND ISSUES

### 10.1 Conclusion

The Study covered all aspects of agriculture development in Lao PDR ranging from technical aspects including environmental issues to institutional aspects including organization, finance and marketing and human resources development. In the light of three distinct development objectives of the Government of Lao PDR as outlined in the Strategic Vision namely to: (i) ensure food security and self-sufficiency in food; (ii) promote commodity agro-products for export; and (iii) stabilize shifting cultivation, the Study formulated an action plan towards the year 2020, the identified the required projects and programs to pursue the objectives. As a result, the Study presents 110 projects and programs, that includes eight on-going and committed projects for implementation. Based on probability of achievement of the objectives and the need for sequencing, 58 of these were evaluated projects and programs to be commenced before the year 2010.

As suggested by several donors in the workshops held in the course of the Study, it is highly likely that Lao PDR may not have the financial and human resource capacity to implement such a large program of works involving the 110 projects and programs over the next 18 year period. It is also likely that implementation of all these projects and programs may not necessarily achieve the target of graduating from the LLDC group by the year 2020 that is the overarching national objective. The Study therefore recommends that the Government of Lao PDR implements the projects and programs steadily, following the priorities presented in this master plan report. The Study Team is of the view that pursuing this agricultural development strategy would ensure the achievement of the overarching goal in the shortest possible time.

It should be noted that the prioritization of projects and programs are provided as a broad indication for implementing the Action Plan. It is therefore recommended that the selection of projects and programs for implementation would be based on the priorities outlined here. Area-based and/or subsector-based priorities need to be incorporated within these overall priorities. The donor's own guideline in assisting Lao PDR would also be taken into account in selection of these projects and programs.



## **10.2 Implementation Issues and Prerequisite**

### 10.2.1 Introduction

There are many areas that have the potential to act as constraints to the smooth implementation of the Action Plan after it has been endorsed by Government. In addition, there is need for many preparatory actions if the full benefits of the projects and programs are to be realized. What follows are some recommendations on the basic preparatory actions and prerequisites that are considered necessary prior to commencement of implementation.

### 10.2.2 Policy Actions

Implementation of the Action Plan requires an enabling policy environment for farmers and agro processors to conduct economic activity unhindered by controls, interventions and unfair competition. Much progress has been made in moving to a market economy and improving the efficiency of commodity and factor markets through rehabilitation and expansion of infrastructure facilities. However, there are some interventions that should be addressed to achieve immediate efficiency gains. These are the lifting of indirect controls on the movement of produce across provinces, government withdrawal from trading in agricultural commodities, and improving the efficiency of rural financial markets. There is an urgent need to remove subsidies on interest rates as this leads to inequitable distribution of government financial services with benefits accruing only to a select small group of the rural population. There is also a need to move forward on land registration and ownership as well on security of tenure issues if the full benefits of the program of investments under the Action Plan are to be realized. It is recommended that, as a matter of priority, Government appoints a Task Force comprising senior government officers from relevant ministries to review existing arrangements and prepare a time bound program for removal of these government interventions as a fundamental pre requisite for the implementation of the Action plan. Such a time bound plan should aim for removal of the above interventions prior to the commencement of the implementation of the Action Plan.

### 10.2.3 Implementation Arrangements

The Study team is of the unanimous view that the single major underlying problem likely to face implementation of the Action Plan is MAF/ PAFS/ DAFO's limited capability to design and implement programs and projects due to the severe shortage of trained and experienced manpower. The few qualified and experienced staff is not rationally distributed; there is an imbalance of technical skills at the district levels with insufficient skills in some areas such as extension and farming systems as well as an insufficient number of staff across the board. The solutions to

this problem are likely to take a concerted long term effort spanning over several years and this is likely to act as a constraint to implementation. In the interim period, it is recommended that MAF set up an Action Plan Implementation Unit under the Planning Department. The Unit would be responsible primarily for setting up a core team or Implementation Team for each program and project taken up under the Action Plan. The Implementation Team should comprise the key implementing staff that is qualified and experienced technical staff as well as staff for planning, monitoring as well as for administration and accounting. While such an approach is likely to take qualified and experienced staff away for current duties, it would ensure that the best staff is employed for implementation. The Implementation Unit should be responsible for monitoring project progress and implementation with the head of the Project Implementing team reporting on a quarterly basis to the Head of the MAF Implementing Unit. The Implementing progress should be reviewed annually at a meeting convened by MAF wherein the project progress, constraints and bottlenecks and the forthcoming years program would be discussed and agreed to. This annual meeting would be for discussion and review of Action plan projects and programs only and may include donor agencies responsible for assisting the respective programs/projects.

#### 10.2.4 Recurrent Expenditure Fund

The problem of operation and maintenance funds for on-going activities is a major problem in MAF and all other ministries of Government. The low operation and maintenance budgets is also combined with lack of transport facilities, financial constraints on allowances permitted for fieldwork, inadequate research and laboratory facilities and lack of proper maintenance for equipment and completed construction works. The dependence on government budgetary allocations has had a detrimental effect on the day-to-day operations of field activities. It is therefore recommended that a Recurrent Expenditure Fund be set up for the Action Plan. This fund is to provide supplementary source of funding for Action Plan project/program activities, if and when the normal operation and maintenance allocations are insufficient. These should particularly be utilized for field staff allowances and for basic requirements for fieldwork such as purchases for field day demonstrations and demonstration plots and for animal disease prevention. The Fund should be centrally maintained and managed. The Fund should receive monies from the sale of vaccines from the government factory, monies from the sale of foundation paddy seed, other seeds, sale of plant and fish fingerlings, sale of government cattle and day old chicks, pigs sucklings and other revenue generating operations. The Fund should also provide a facility to encourage donors and NGO's to contribute to

recurrent funds to supplement the government recurrent expenditure budgetary allocation.

The Fund is not recommended so as to take the place of government annual budgetary allocations for recurrent expenditure. It is only meant to supplement these allocations and be a stand by for some project/programs in the Action Plan that may be in critical need of recurrent funds for project success. The Fund is also not meant to serve as a continuing source of recurrent expenditure for some activity. It is meant as a stand by or emergency source in situations where the success of a project or program is jeopardized such as in the event of localized crop damage, or a localized animal disease outbreak.

#### 10.2.5 Coordination of Donor Assisted Projects

Policies and procedures, especially in area development projects pursued in donor-assisted projects have not been uniform. For example, the Study Team found that fertilizer was made available at different subsidized prices under different projects and different from government prices. The same was true for fruit seedlings and fish fingerling distribution. At the same time, the private sector was selling seedlings and fish fingerlings at higher market prices. This situation runs counter to pursuing a uniform government policy and at the same time gives wrong market signals and kills private initiative. There is therefore a need to coordinate all input and output distribution and price policies of donor assisted projects and the enforcement of guidelines to ensure that all donor assisted project components are in line with government policies and strategies. It is recommended that prior to commencement of the implementation of the Action Plan new guidelines be drawn up for the coordination of all donor assisted program/project activities and that the details of policy guidelines and procedures be made known and agreed to between donor agencies and Government. Furthermore, that the details of implementation with emphasis on government staff involvement in project formulation, implementation and financial management be agreed to prior to commencement of the project.

#### 10.2.6 Need for Inter-Agency Coordination Mechanisms

Most of the projects and programs require concerted action on implementation from more than one government agency. In addition, there are several programs listed here that are the primary responsibility of agencies outside MAF. For example, rural roads, cottage industries, rural finance and trade initiatives are the primary responsibility of other agencies. It is therefore essential that all these programs are synchronized and sequenced to ensure maximum impact. For example, a crop technology improvement program would not have maximum impact if the rural

finance program were not integrated into this project. It is also important that the budgetary process ensures a synchronized allocation of funds. This means coordination in the requests from various agencies for budgetary funds for these programs. It is recommended that in order to ensure this coordination that one Working Unit with several sub-units be set up. Such a Unit should have permanent staff due to the long time horizon of the Action Plan. Such a Unit should be above Ministry level and should be responsible for coordination, including coordination of donor inputs, securing adequate budgetary allocations, ensuring adequate staff support and recruitment (inter-agency level), if necessary, and conduct of regular review of project/program progress with a view to ensuring inter-agency coordination and for removing any bottlenecks.

#### 10.2.7 Annual Meeting for Progress and Reporting to Donors

The donor contribution to the PIP and to the Action Plan is expected to be substantial. It is therefore necessary to ensure that the priorities and sequencing outlined should be adhered to. Due the vital importance of donors in the implementation of the Action Plan, it is recommended that once the Plan has been accepted by Government, a meeting of all donors including NGO's be convened. The purpose of the meeting would be to explain and clarify the goals and targets of the Action Plan; the prioritization and sequencing and to outline the actions Government will take as prerequisites to help implement the Plan. The Meeting will also help to clarify the Government's response to the prerequisites and other issues related to implementation. It would also review the Government's proposals for strengthening the implementation capacity of MAF and the related local government agencies; and any proposals for improving project technical and financial sustainability.

The meeting should be held annually and is meant to highlight the progress under different projects and programs, the actions taken by government for assisting implementation, the constraints and bottlenecks facing the program and a plan of action for the forthcoming year. The annual meeting would also highlight the overall progress of the Agriculture sector and the proposals and targets for the forthcoming year.

#### 10.2.8 MAF- Provincial Linkages

The Study team assessed that the link between MAF and the local government agencies in terms of implementation was very weak following decentralization. While staff and administration at the local government level of PAFS and DAFO continues to be weak, the capital budget is increasingly in the hands of the

Provincial Governors office and MAF had little or no monitoring or implementing function. This is not a tenable situation when it comes to implementing the Action Plan. It is therefore recommended that the Planning Department of MAF step up its monitoring and evaluation activities and also monitor financial and project achievement monitoring. It is necessary for MAF Planning Department to not only monitor projects and programs but carry out project implementation functions so that it is in a position to identify delays, bottlenecks and constraints and initiate actions with collaborating agencies to facilitate implementation. The MAF Planning Department should also carry out evaluation of projects/Programs on a regular basis so as to ensure timely actions in the event of any bottlenecks.

#### 10.2.9 Integration of the Public Investment Program (PIP) into Action Plan

The PIP process each year is within overall policies, priorities and targets issued by SPC with MOF setting the benchmark level for overall capital expenditure. The line ministries and provincial governments then follow the sectoral plans based on national guidelines and targets. The procedure for preparing the PIP is very much a top-down and bottom-up process as the districts and village authorities are involved in the formulation. After this consultative process, the PIP is submitted to Government and finally to the National Assembly for approval. It is recommended that MAF strengthen its planning and implementing capacity to enable it to be able to implement the Action Plan and the priority selection of the projects and programs. Furthermore, MAF has to incorporate the Action Plan into its agriculture sector plan and issue guidelines at the commencement of each planning year to the provinces and districts to ensure that the PIP process adequately reflects the priorities of the Action Plan. MAF should also be responsible for indicating to MOF and SPC the annual capital and recurrent expenditure requirements as well as the donor contributions and the nature of such contributions. MAF should also review its draft five-year plan to ensure that the Action Plan is consistent with the five-year development plan.

#### 10.2.10 Public Administration Role in Action Plan

Both government and donors have expressed concern with the difficulties in project implementation (7th Roundtable Meeting, October 1999). Capacity building is needed at all levels and lack of skills among civil service is a major impediment to improved implementation. This is associated with a number of factors, most importantly the low level of remuneration as wages and salaries of government officials have fallen significantly both as a percentage of GDP and in real terms in recent years. In addition, poor incentives for working in remote areas, lack of transport facilities and financial constraints on allowances permitted for fieldwork

and low O&M budgets, all severely limit the implementation capacity at the local level. This is also been reflected in low absorption capacity of donor loans and grants, although financial procedures are often more flexible under donor projects. The limit on implementation capacity at the local level along with the above related issues are major areas to be addressed by the Leading Committee for Public Administration Reform that oversees the government's wide ranging Governance and Public Administration Reform Program. However, there are no easy solutions and redressing some of these problems is likely to take many years. In the meantime, it is recommended that government should constantly examine and review the implementation of the Action Plan and take selective Actions from time to time improve the implementation of the Action Plan.

#### 10.2.11 Project Formulation and Cost Estimation

The list of programs of projects provided in the Action Plan is at most in skeleton form. The project objectives, strategy, design, and cost components need to be reassessed in the light of further information. Furthermore, the cost estimates of the proposed programs/projects need to be refined. Overall, the projects and programs identified here are not a sufficient basis for implementation. It is recommended that further detailed work is therefore necessary and this should be undertaken at an early stage, at least for the priority list of projects.

*Attachment-1*  
*Summary of Agricultural Setting and*  
*Development Potential*

Summary of Agricultural Setting and Development Potential (1/3)

Province	District	UXO Risk Evaluation	Potential Assessment (ha/person)	Grouping
Phongsali	Phongsali	0	3.8	1
	Gnot-Ou	0	10.9	2
	Samphan	1	3.1	1
	Boun-Nua	0	-1.4	2
	Boun-Tai	0	-0.1	1
	Mai	1	11.0	1
	Khoa	1	-1.0	1
Louangnamtha	Sing	1	-1.5	1
	Long	0	-1.0	1
	Louang-Namtha	1	-1.2	2
	Viangphoukha	1	-0.1	1
	Nale	1	-1.8	1
Oudomxai	La	0	-2.0	1
	Xai	0	-2.2	1
	Beng	0	-3.3	1
	Houn	0	-1.1	1
	Nga	0	-1.0	1
	Pakbeng	0	-1.2	1
	Namo	0	-3.1	1
Bokeo	Meung	0	-1.0	6
	Houayxay	0	-1.8	2
	Pha-Oudom	0	-1.6	6
	Paktha	0	-3.1	1
	Tonpheung	0	-2.8	2
Louangphrabang	Nambak	2	-1.9	1
	Ngoy	4	-1.4	8
	Pak-Ou	2	-1.6	1
	Pakxeng	1	-1.2	1
	Louangphrabang	2	-1.6	1
	Chomphet	2	0.0	1
	Xiang-Ngeun	2	-0.1	1
	Viangkham	1	-0.3	1
	Phoukhoun	1	9.9	1
	Phonxai	1	-1.6	1
	Nan	0	4.5	1
Houaphan	Xam-Tai	1	-2.1	1
	Houamuang	1	3.7	1
	Viangxai	2	-2.3	2
	Xam-Nua	1	2.2	2
	Viangthong	1	5.8	2
	Et	2	-2.2	2
	Xiangkho	2	-1.9	2
	Sopbao	2	-2.7	2
Xaignabouri	Khop	0	-3.3	2
	Xianghon	0	-3.0	2
	Ngeun	0	-3.6	2
	Hongsa	0	-1.1	2
	Boten	0	1.7	9
	Phiang	0	-1.0	2
	Xaignabouri	0	4.0	2



Summary of Agricultural Setting and Development Potential (2/3)

Province	District	UXO Risk Evaluation	Potential Assessment (ha/person)	Grouping
Xaignabouri	Paklai	0	-1.7	2
	Kenthao	0	3.0	9
	Thongmixai	0	-2.3	2
Vientiane Mun.	Hatxayfong	0	-0.9	7
	Xaisettha	0	-1.4	7
	Chanthabouri	0	-0.6	7
	Sisattanak	0	-0.5	7
	Sikhottabong	0	-0.9	7
	Sangthong	2	-3.6	5
	Xaithani	0	-1.5	5
	Naxaythong	0	-2.8	5
	Pak-Ngum	2	-3.4	5
Xiangkhouang	Nonghet	2	-0.8	8
	Pek	5	-2.4	2
	Kham	3	-1.4	2
	Khoun	4	-1.2	2
	Phaxai	4	6.9	2
	Phoukout	2	3.0	2
	Mok-Mai	1	8.3	2
Vientiane Prov.	xanakham	1	1.5	2
	Fuang	2	-4.4	2
	Phonhong	0	-4.1	5
	Vangvieng	2	-3.5	2
	Keo-Oudom	0	-3.8	5
	Kasi	1	3.2	2
	Thourakhom	0	-3.3	5
	Hinheup	2	-3.8	2
	Viangkham	0	-2.7	5
	Met	1	-4.4	2
Borikhamxai	Pakxan	2	-1.4	5
	Viangthong	1	2.7	1
	Pakkading	1	-1.4	2
	Khamkeut	1	-1.2	2
	Borikhan	1	-2.2	1
	Thaphabat	0	-3.3	5
Khammouan	Hinboun	1	-2.3	3
	Nakay	1	-1.9	6
	Thakhek	2	-3.3	3
	Mahaxai	4	-4.7	3
	Boualapha	2	-3.6	6
	Xaibouathong	4	-3.0	6
	Xebangfai	5	-4.1	3
	Nongbok	0	-2.4	4
	Gnommalat	4	-4.2	3
Savannakhet	Xepon	4	-2.5	1
	Nong	1	-2.0	6
	Thapangthong	1	-5.0	3
	Khanthabouri	0	-3.0	3
	Xaibouri	2	-4.1	4
	Songkhon	0	-6.0	4
	Outhoumphon	2	-2.6	3

Summary of Agricultural Setting and Development Potential (3/3)

Province	District	UXO Risk Evaluation	Potential Assessment (ha/person)	Grouping
Savannakhet	Xonbouri	5	-6.3	3
	Atsaphangthong	5	-3.4	4
	Atsaphon	3	-4.5	3
	Vilabouri	4	-4.5	6
	Phin	1	-4.9	6
	Xaiphouthong	0	-2.8	4
	Phalanxai	5	-4.0	3
	Champhon	2	-3.4	4
Xaisomboun S/R	Thathom	2	-3.5	2
	Phoun	4	5.5	2
	Xaisomboun	0	16.6	2
	Longxan	1	-6.8	2
	Hom	1	-5.4	2
Saravan	Samouay	4	-1.4	1
	Toumlan	5	-5.3	3
	Ta-Oy	1	-0.7	1
	Lakhonpheng	2	-2.6	4
	Vapi	5	-4.0	4
	Saravan	5	-4.2	4
	Laongam	5	-1.7	1
	Khongxedon	5	-3.0	4
Xekong	Karum	1	0.1	1
	Dakchung	4	-1.8	1
	Lamam	1	-2.5	1
	Thateng	5	-2.0	1
Champasak	Xanasomboun	3	-3.1	4
	Pakxe	3	-2.6	3
	Phonthong	2	-4.7	4
	Bachiangchareuns	2	-2.2	1
	Pakxong	1	7.0	10
	Pathoumphon	1	-3.9	3
	Khong	2	-3.0	3
	Mounlapamok	1	-1.5	3
	Champasak	2	-4.3	4
	Soukhouma	2	-4.7	4
Attapu	Xaisettha	2	-3.7	3
	Sanxai	1	-1.1	1
	Phouvong	1	5.7	6
	Sanamxai	1	-4.3	3
	Samakxixai	5	-3.3	3

***Attachment-2***  
***List of Proposed Programs and Projects***

## 1. Land and Water Resource Development (1/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
LW-1	Strengthening LUP & LA and Land Titling in Rural Area	Shifting Cultivation Stabilization Program, DOF, MAF/PAFO, DAFS	A(S)	Nationwide	<p>(1) To strengthen the existing system of LUP/LA through the synthesis of macro-level planning based on national development goals and micro-level planning based on the needs for local area development.</p> <p>(2) To improve monitoring &amp; evaluation (M &amp; E) of LUP/LA in order to encourage village management of agricultural, forestry and other resources.</p> <p>(3) To develop LUP/LA information storage procedure to facilitate land titling and registration in the future.</p>	<p>(1) Networking of relevant government agencies involved in LUP/LA.</p> <p>(2) Development of the National Implementation Plan based on criteria for prioritization.</p> <p>(3) Follow-up activities for the villages with LUP/LA.</p> <p>(4) Extension of field tested methodologies.</p> <p>(5) Implementation of training program for national, provincial, and district staff.</p> <p>(6) Refining M &amp; E procedure.</p> <p>(7) Development of information storage system.</p>
LW-2	T/A on Nationwide Shared Water Resources Management	STEA/MAF	B	Nationwide	<p>(1) To develop water use and distribution plan for agriculture, urban, industry and power sectors.</p> <p>(2) To monitor quality and quantity of water for different end-users.</p>	<p>(1) Establish optimum water use among the affected sectors.</p> <p>(2) Establish adequate water resources development plans that are environmentally sustainable.</p> <p>(3) Provide adequate water and soil testing equipment and methodologies.</p>
LW-3	Watershed Management Program	MAF/STEA	A (S)	Nationwide	<p>(1) Sustain water resources for water related social and economic activities, hydropower, irrigation, fisheries, etc.</p> <p>(2) Protect people and their properties and lands from floods and soil erosion.</p> <p>(3) Maintain sustainable agricultural production in all areas.</p>	<p>(1) Establish procedures for integrated watershed management through development and implementation of watershed management plans where water related projects have been developed or are planned.</p> <p>(2) Provide adequate water and soil testing equipment and methodologies.</p>
LW-4	Agro-Zone Classification, Land Management and Farming Systems Development	NAFRI	A (S)	Vientiane	<p>(1) To develop the agro-zone classification maps.</p> <p>(2) To assist land use planning and cropping pattern.</p> <p>(3) To use remote sensing to help with land classification and land use.</p>	<p>(1) Expansion of land classification maps and crop suitability maps.</p> <p>(2) Establish a feedback system for ground truthing to upgrade GIS data. (3) Reconcile information between GIS and agriculture census data. (4) Develop agro-zone classification maps.</p>
LW-5	Soil and Water Conservation Technology Research Program	NAFRI/DOF	B	Vientiane & Nationwide	<p>(1) To develop appropriate technologies for soil and water management.</p>	<p>(1) Review completed and ongoing projects concerned with soil conservation. (2) Develop a technical support system for soil conservation on sloping areas.</p>
LW-6	Irrigation Water Management Research Program	NAFRI/DOI	B	Vientiane	<p>(1) To develop appropriate technologies for irrigation water management.</p>	<p>(1) Develop irrigation water management systems for lowland and upland crops.</p> <p>(2) Research effective participatory approaches to irrigation water management.</p> <p>(3) Provide technical staff training (on the job and in-country research courses).</p>

## 1. Land and Water Resource Development (2/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
LW-7	Rehabilitation and Expansion of Meteo-hydrology Stations for Agriculture Development and Flood Control	DMH/MAF	A	Nationwide	To Strengthen weather forecast for agriculture development to increase food crop production and flood forecast to mitigate agricultural damage	<ol style="list-style-type: none"> <li>(1) Rehabilitate of meteo-hydrological stations including agro-meteorology stations and renewal of instrument/equipment.</li> <li>(2) Construct new meteo-hydrology station including agro-meteorological stations.</li> <li>(3) Provide modernized communication equipment.</li> <li>(4) Provide computer LAN system to upgrade collection /transferring /compilation /filling and analysis.</li> <li>(5) Improve weather and flood forecast system.</li> <li>(6) Construct facilities for calibration of hydrological instrument/equipment and equipment test room.</li> <li>(7) Institutional Improvement of operations and management.</li> <li>(8) Train staff of DMH and Provincial Meteo-hydrology Office through participatory survey, planning, supervision of construction and overseas training .</li> <li>(9) Prepare educational program for staff of DMH and Provincial Meteo-hydrology Office.</li> </ol>
LW-8	Support to STEA for Environmental Friendly Agriculture Development	STEA/Prime Minister's Office	B	Nationwide	<ol style="list-style-type: none"> <li>(1) To support the implementation of community based resource and land management associations.</li> <li>(2) To support improved environmental data collection.</li> <li>(3) To assist in the formulation of environmental impact regulations for agriculture, forestry and fisheries to support provincial environmental initiatives.</li> </ol>	<ol style="list-style-type: none"> <li>(1) Promote community group formation.</li> <li>(2) Establish participatory data collection and analysis systems.</li> <li>(3) Enhance reporting arrangements to STEA and agro-service industries.</li> </ol>
LW-9	Strengthening of Weather Forecast System for Agriculture Activities and Disaster Operation	DMH/MAF	B	Nationwide	To secure agricultural production and mitigate disaster damage	<ol style="list-style-type: none"> <li>(1) Construction of weather surveillance radar stations in northern and southern regions for real time tracking of tropic storms.</li> <li>(2) Construction of upper-air stations in Vientiane city.</li> <li>(3) Upgrading weather and flood forecasting systems.</li> <li>(4) Install telecommunication system and establish network system.</li> <li>(5) Institutional improvement of operation and management</li> <li>(6) Educational upgrading program for DMH and provincial meteo-hydrological service office</li> </ol>

## 2. Institutions and Organizations (1/3)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
IO-1.	Institutional Development and Strengthening of the Ministry of Agriculture and Forestry					
IO-1.1	Strengthening Administration and Management Procedures of MAF	MAF/Permanent Secretary/PAFS /DAFO	A	MAF, Permanent Office, Administration Section of PAFS and DAFO Nationwide	To strengthen the capacity of MAF's Department and Agencies including PAFS and DAFO in public administration and management through institutional strengthening and human resource development; and to restructure and strengthen the administration and planning division (Administration Section) of MAF's Department, PAFS and DAFO.	<ul style="list-style-type: none"> <li>(1) Technical assistance for strengthening administration and management procedure (planning, M&amp;E and reporting),</li> <li>(2) establishment of improved administration and management procedures,</li> <li>(3) elaboration and implementation of in-service training courses and study tours of staff in related administration and management subjects for MAF, PAFS and DAFO (to be combined with RAFETC Training Program)</li> </ul>
IO-1.2	Strengthening Planning and Statistical Capacity of MAF	MAF/DOP/PAFS /DAFO	A	MAF, DOP, Planning Section of PAFS and DAFO Nationwide	To strengthen the capacity of MAF's Department and Agencies including PAFS and DAFO in regulatory planning and statistics through institutional strengthening and human resource development; and to restructure and strengthen the administration and planning division (Planning & Statistics Section) of MAF's Department, PAFS and DAFO.	<ul style="list-style-type: none"> <li>(1) Technical assistance for strengthening bottom-up planning and statistical capacity of MAF Departments and related agencies including PAFS and DAFO.</li> <li>(2) Develop a bottom-up planning and management information system from DAFO to MAF.</li> <li>(3) Introduce new technology for statistical collection of data (sample surveys, objective yield survey, use of remote sensing information).</li> <li>(4) develop early warning information system.</li> <li>(5) Provision of IT equipment and materials for planning and statistic.</li> <li>(6) elaboration and implementation of in-service training courses and study tours of staff in related planning and statistical subjects for MAF, PAFS and DAFO (to be combined with RAFETC Training Program).</li> </ul>
IO-1.3	Strengthening Human Resource Management of MAF	MAF/Department of Personnel/ PAFS/ DAFO.	A	MAF, Dept of Personnel, Personnel section of PAFS, DAFO Nationwide	To strengthen the capacity of MAF's Department and Agencies including PAFS and DAFO in human resource management through institutional strengthening and human resource development; and to restructure and strengthen the administration and planning division (Personnel Section) of MAF's Department, PAFS and DAFO.	<ul style="list-style-type: none"> <li>(1) Technical assistance for strengthening personnel management department of MAF and related agencies including PAFS and DAFO.</li> <li>(2) Development of job description personnel data base, career development program, in-service training program based on training need assessment.</li> <li>(3) Establishment of a Human Resource Development Center (HRDC) at MAF for planning, monitoring and coordinating human resource development activities.</li> <li>(4) Elaboration and implementation of in-service training courses and study tours of staff in related human resource development subjects for MAF, PAFS and DAFO (to be combined with RAFETC Training Program).</li> </ul>

## 2. Institutions and Organizations (2/3)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
IO-2	Consolidation of Management and Planning Capacity of MAF Institutions	MAF/PAFS/DAFO	B	Nationwide	To consolidate and strengthen the administration and planning division of provincial and district offices related to agriculture and rural development under the decentralization policy; and to consolidate the institutional strengthening and human resource development activities of MAF, PAFS and DAFO.	(1) Follow-up of the institutional strengthening activities initiated during the previous Institutional Strengthening Projects (2) Follow-up of in-service training courses for MAF, PAFS and DAFO staff.
IO-3	Study Tour Program for Local Decision-Makers	Provincial Offices	B	Nationwide	To acquire knowledge of decentralized administrative approaches.	Make study tours by representatives of province and district offices to other countries
IO-4	NAFRI Strengthening Program	NAFRI	A	NAFRI Research Centers located in Vientiane Municipality, Champasak and Louangphrabang Provinces	To develop an efficient and effective research system for agriculture and rural farming system through institutional strengthening, staff capacity building and research facility upgrading	Please refer to project components of sub-project 4.1, 4.2 and 4.3.
IO-4.1	NAFRI Institutional Strengthening and Restructuring Project	NAFRI	A	Nationwide	The same as above.	(1) Installation of IT network and database system to develop a knowledge management system, (2) Technical assistance for research coordination and management system, research planing including selection and prioritization of various research programs, establishment of monitoring and evaluation (M & E) system for research activities, strengthening of linkage with research institutes in neighboring countries, and (3) Technical training on IT network as well as research management, research planning and M&E system.
IO-4.2	NAFRI Staff Capacity Building Project	NAFRI	A	Nationwide	The same as above.	(1) Technical assistance for establishing training program for in-service training, in-country training courses, and overseas training in specific field. (2) Implementation of above training programs. (3) Monitoring and evaluation of training program. (4) Establishment of personal database for management of personal history of NAFRI staff.
IO-4.3	NAFRI Research Upgrading Project	NAFRI	A	Nationwide	The same as above.	(1) Technical assistance for inventory and assessment of research facilities and equipment, establishment of preliminary rehabilitation plan. (2) Consultancy service on rehabilitation plan, design, cost estimation as well as preparation of tender document. (3) Rehabilitation of facilities and installation of equipment.

## 2. Institutions and Organizations (3/3)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
IO-5	ASEAN Countries Research Coordination	NAFRI	B	Nationwide	To establish coordination system for research activities with neighboring countries to enhance research effect and efficiency.	(1) Invitation to ASEAN scientists to undertake research work and study tours in Lao PDR. (2) Annual coordination meeting with relevant institutes. (3) Establish a system for exchange of research information.
IO-6	Plant Quarantine Strengthening Project	National Plant Protection Organization (NPPO)/DOA	A	Vientiane & Nationwide	To enhance the confidence in country's agricultural products for export and to secure crop protection in Lao PDR through strengthening the plant quarantine system	(1) Technical assistance for review of existing regulation and strengthening the plant quarantine system. (2) Rehabilitation of inspection points, laboratory, and equipment. (3) Establishment of six new inspection posts at the borders with Myanmar, and Cambodia. (4) Implementation of training for the plant quarantine inspection staff.
IO-7	Legislation for Agro-chemicals	DOA	B	Vientiane & Nationwide	To protect natural resources and prevent accident among farmers by the use of chemicals.	(1) Revision of regulations on use of chemicals. (2) Creation of a certificate system for distributors and wholesalers of agro-chemicals.
IO-8	Seed Import Regulations and Seed registration and Certification system	DOA	B	Vientiane & Nationwide	To develop a variety registration and certification system for seeds and planting materials.	(1) Review regulations on the use of seed and planting materials. (2) Develop a seed certification system and facility. (3) Train staff on variety registration and seed certification procedure.
IO-9	Development of MAF's and Local Governments' New Roles in the Market-driven Economy (T/A)	Prime Minister's Office (Leading Committee for Institutional and Administrative Reform)	B	MAF and all provinces	To make a master plan and proposals for the new roles of MAF and local government in the market-driven economy	(1) To review the roles of government and private sector in the new macro-economic framework of the country. (2) To study the appropriate roles of MAF and local government in agriculture. (3) To study appropriate management system and the organizational structure of MAF and local government in all aspects of decision-making, personnel evaluation, information management, project monitoring and evaluation, financial management and technology development.



### 3. Human Resource Development (1/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
HR-1	Strengthening Agriculture and Forestry Extension Services	MAF/ NAFEA	A	MAF, NAFEA, Nationwide	To strengthen agricultural and forestry extension services through the institutional strengthening of agricultural and forestry organizations at the district, provincial and central levels.	<ol style="list-style-type: none"> <li>(1) Technical assistance for the organization and institutionalisation of the National Agriculture and Forestry Extension Agency (NAFEA).</li> <li>(2) Technical assistance for supporting Extension Training Units of NAFEA, PAFS and DAFO.</li> <li>(3) Training of SMS, Provincial and District Trainers and Provincial Extension Support staff.</li> <li>(4) OTJ Training for FSEW.</li> <li>(5) development and implementation of district extension projects.</li> <li>(6) Development of provincial and district Extension Training Units.</li> </ol>
HR-2	Development of District In-service Training and Farmer Training in Agriculture and Forestry (Phase 1)	MAF/ RAFECT-FVS	A	RAFECT-FVS in Xiengneun-Louangprabang, Pakcheng-Vientiane province, Xepon-Savannakhet / FVS in Louangnamtha, Houaphan, Champassak	To strengthen agricultural and forestry extension services at district and village levels by developing and strengthening the capacity of Regional Agriculture and Forestry Extension Training Centers (RAFETCs), and by providing vocational training in agriculture and forestry to farmers communities.	<ol style="list-style-type: none"> <li>(1) Technical assistance for the development of training and extension program of the RAFETCs and FVS.</li> <li>(2) Technical assistance for the development of curricula and training materials for the RAFETCs and FVSs.</li> <li>(3) Development of model extension and training field areas for RAFETCs.</li> <li>(4) Improvement of RAFETCs facilities.</li> <li>(5) Development of FVS facilities and field practice farms.</li> <li>(6) Formal training of District Regulatory Staff and FSEW.</li> <li>(7) Training of farmers' communities.</li> </ol>
HR-3	Development of District In-service Training and Farmer Training in Agriculture and Forestry (Phase 2)	MAF/PAFS/FVS	B	FVS in 11 provinces	To strengthen agricultural and forestry extension services by providing vocational training in agriculture and forestry to farmers communities.	<ol style="list-style-type: none"> <li>(1) Staged replication of the FVS model in all provinces.</li> <li>(2) Development of FVS facilities and field practice farms.</li> <li>(3) Training of farmers' communities.</li> </ol>
HR-4	Strengthening the Capacity of Technical Education in Agriculture and Forestry	MAF/AFTS	A	Pakxueg-Louangprabang AFTS, Muongmai-Bolikhamxay AFTS, Nakae-Savannakhet AFTS, Pakse-Champassak AFTS	To upgrade the quality of agriculture and forestry technician's education through the improvement of curricula and syllabi and the improvement of 4 existing Agriculture and Forestry Technician Schools' facilities.	<ol style="list-style-type: none"> <li>(1) Technical assistance for curriculum development.</li> <li>(2) Technical assistance for lecture notes and text books development.</li> <li>(3) training of teachers and trainers.</li> <li>(4) Overseas scholarships for teachers and trainers.</li> <li>(5) Production of lecture notes and text books.</li> <li>(6) Improvement of school facilities.</li> <li>(7) Establishment of school farm for field practice.</li> </ol>

### 3. Human Resource Development (2/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
HR-5	Irrigation Technician School Improvement	MAF/ Thangone ITS	A	Thangone ITS Vientiane Municipality	To develop irrigation technician's education and training through the improvement of curricula and syllabi and the improvement of the existing Thangone Irrigation Technician Schools' facilities.	<ul style="list-style-type: none"> <li>(1) Technical assistance for curriculum development.</li> <li>(2) Technical assistance for lecture notes and text books development.</li> <li>(3) Training of teachers and trainers.</li> <li>(4) Overseas scholarships for teachers and trainers (will be incorporated into AFTS scholarship program).</li> <li>(5) Production of lecture notes and text books.</li> <li>(6) Improvement of school facilities.</li> <li>(7) Establishment of school field practice area.</li> </ul>
HR-6	Program for Strengthening the Capacity of University Education in Agriculture and Forestry	MAF, Min of Education, NUOL	A	Dongdok Faculty of Forestry, Tadthong Dept. of Irrigation Engineering, Nabong Faculty of Agriculture	<ul style="list-style-type: none"> <li>(1) To up-grade the university level training in irrigation and water resource management, crops, livestock and fisheries, forestry and agro-forestry through improved curriculum and syllabus, and resource development.</li> <li>(2) To develop formal training and education in irrigation for future SMS and for future irrigation engineers, agriculture engineers, forestry engineers and superior technicians.</li> </ul>	<ul style="list-style-type: none"> <li>(1) Follow-up of the on-going technical assistance program in the Forestry and Agriculture Faculties.</li> <li>(2) Improvement of Bachelor and Master degree curriculum and syllabus in irrigation engineering, based on the formation of SMS.</li> <li>(3) Establishment of BSc Bridging program for SMS.</li> <li>(4) Strengthen the capacity of the Tadthong Department of Irrigation Engineering, the Nabong Faculty of Agriculture and the Dongdok Faculty of Forestry through teacher training, teaching aids development, and teaching facility development including rehabilitation of facilities.</li> </ul>
HR-7	Agriculture and Forestry Education in Primary and Secondary Schools Development	MAF	B	Min. of Education, all provinces	To improve agriculture education in primary and secondary schools, particularly rural schools.	<ul style="list-style-type: none"> <li>(1) Improve curriculum and syllabus for agriculture and environmental education.</li> <li>(2) Training of teachers in agriculture subjects.</li> <li>(3) Elaborate and provide teaching materials and teaching aids including posters, lecture books, simple experimental equipment and funds.</li> <li>(4) Promote school vegetable gardens, animal husbandry and tree nurseries.</li> </ul>

#### 4. Crops; Extension, Research and Others (1/7)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
<b>Rice Production</b>						
AC-1	Rice Seed Multiplication Systems improvement	Agriculture Research Center (ARC)/NAFRI and Napok Seed Multiplication Center/DOA	A	Nationwide	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.	(1) Rehabilitate existing seed multiplication facilities. (2) Restructure the seed multiplication system including the production of foundation seeds. (3) Technical training of staff for seed multiplication. (4) Technical training for rice seed farmers.
AC-2	Rice Storage for Emergency Purpose	DOA	B	Nationwide	To ensure national food security.	(1) Establish and rehabilitate storage for emergency purpose in remote area. (2) Strengthen management and technical capability of key staff. (3) Establish of training program for the private sector.
AC-3	Integrated Upland Agricultural Research Project (IUARP)	Northern Region Agriculture and Forestry Research Center (NRAFRC)/ NAFRI	S	Louangphrabang province	(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, and (3) To enhance community development, decision making and leadership capacity within the target communities.	(1) Technical assistance for research programming. (2) Training of the project staff and PAFS/DAFO staff. (3) General and direct operating expenses. (4) IUARP operation equipment including computers and motorcycles.
<b>Commercial Crop Production</b>						
AC-4	Crop Diversification Program	DOA/PAFS/DAFO	A	Irrigation Area in Mekong Corridor of Borikhamxa, Khammuane, Savannakhet, Saravan, and Champasack Provinces	To enhance farm income through expansion of crop diversification for second crop season in irrigation area.	(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 establishment of community management nursery preparation. (6) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&E) survey.

#### 4. Crops; Extension, Research and Others (2/7)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
AC-5	Outer City Horticulture Promotion Program	DOA/PAFS/DAFO	A	Vientiane and Borikhamxa Provinces and Vientiane Municipality	To enhance farm income through expansion of horticulture production in outer city area.	<ol style="list-style-type: none"> <li>(1) Technical assistance for overall project management, preparation of crop management calendar, selection, design and establishment of demonstration plots.</li> <li>(2) Implementation of training program for DOA, PAFS and DAFO staff.</li> <li>(3) Technical assistance for operation and maintenance of demonstration plots.</li> <li>(4) Implementation of technical guidance to farmers in the demonstration plots.</li> <li>(5) Technical assistance for formulation of production and marketing groups.</li> <li>(6) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&amp;E) survey.</li> </ol>
AC-6	Sustainable Sugarcane Production Promotion Program	DOA/PAFS/DAFO	B	North Region	To increase sugarcane production under appropriate farming systems.	<ol style="list-style-type: none"> <li>(1) Implement a market study for export of sugar and/or sugar cane to China and Thailand.</li> <li>(2) Implement of participatory land use planning for sustainable sugar production.</li> <li>(3) Establish demonstration plots to provide improved techniques including eco-friendly farming system for farmers in cooperation with research outputs.</li> </ol>
AC-7	Export Oriented Crop Promotion Program	DOA/PAFS/DAFO	A	Xaignabouri, Bokeo, Louangnamtha and Xiangkhouang provinces	To expand export oriented crop production including agro-processed products in border provinces.	<ol style="list-style-type: none"> <li>(1) Technical assistance for study on export oriented agriculture development in border provinces.</li> <li>(2) Technical assistance for overall project management, preparation of crop management calendar, and establishment of demonstration plots.</li> <li>(3) Implementation of training program for DOA, PAFS and DAFO staff.</li> <li>(4) Technical assistance for operation and maintenance of demonstration plots.</li> <li>(5) Implementation of technical guidance to farmers in the demonstration plots.</li> <li>(6) Technical assistance for formulation of community managed agro-processing unit (CMAU).</li> <li>(7) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&amp;E) survey.</li> </ol>

#### 4. Crops; Extension, Research and Others (3/7)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
AC-8	Fruits Crop Promotion Program in Northern Region	DOA/PAFS/DAFO	A	Upland and mountainous areas in Louangphrabang, Oudomxai, Phongsali provinces	To generate additional income through introduction or expansion of fruit cultivation in upland and mountainous areas in Northern region.	<ol style="list-style-type: none"> <li>(1) Technical assistance for overall project management, preparation of crop management calendar, selection, design and establishment of demonstration plots.</li> <li>(2) Implementation of training program for DOA, PAFS and DAFO staff.</li> <li>(3) Technical assistance for operation and maintenance of demonstration plots.</li> <li>(4) Implementation of technical guidance to farmers in the demonstration plots.</li> <li>(5) Technical assistance for formulation of production and marketing groups.</li> <li>(6) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&amp;E) survey.</li> </ol>
AC-9	Fruits Crop Promotion Program in Southern Region	DOA/PAFS/DAFO	A	Upland and mountainous areas in Xekong and Attapu provinces	To generate additional income through introduction or expansion of fruit cultivation in upland and mountainous areas in Southern region.	<ol style="list-style-type: none"> <li>(1) Technical assistance for overall project management, preparation of crop management calendar, selection, design and establishment of demonstration plots.</li> <li>(2) Implementation of training program for DOA, PAFS and DAFO staff.</li> <li>(3) Technical assistance for operation and maintenance of demonstration plots.</li> <li>(4) Implementation of technical guidance to farmers in the demonstration plots.</li> <li>(5) Technical assistance for formulation of production and marketing groups.</li> <li>(6) Implementation of agricultural needs assessment and baseline survey, and monitoring and evaluation (M&amp;E) survey.</li> </ol>

#### 4. Crops; Extension, Research and Others (4/7)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
<b>Sericulture</b>						
AC-10	Sericulture Development Project	Sericulture Research and Extension Center (SREC)/DOA/PAS/DAFO	A	Nationwide	To generate additional income in rural area through expansion of production of qualified cocoon and raw silk.	<ol style="list-style-type: none"> <li>(1) Technical assistance for overall project management, mulberry plantations, silkworm rearing, participatory development for village revolving funds, post cocoon activities, and marketing.</li> <li>(2) Technical assistance for rehabilitation plan of equipment and stations, upgrading egg production technology, design, cost estimation as well as preparation of tender documents.</li> <li>(3) Rehabilitation of SREC and installation of necessary equipment.</li> <li>(4) Selection of priority villages for implementation of the project.</li> <li>(5) Establishment of village revolving funds and formulation of farmers groups under the technical assistance of local NGOs.</li> <li>(6) Implementation of training program for staff and farmers.</li> <li>(7) Implementation of technical guidance to sericulture farms in terms of establishment of mulberry plantations and silkworm rearing house, maintenance of those facilities, silkworm rearing, post cocoon activities.</li> </ol>
AC-11	Private Sector Assistance Project for Silk Production (Large Scale)	Sericulture Research and Extension Center (SREC)/DOA/PAS/DAFO	B	Nationwide	To facilitate the production of qualified cocoon and raw silk in private factories.	<ol style="list-style-type: none"> <li>(1) Establish a production system for hybrid (bi-bi) silkworm eggs.</li> <li>(2) Provide technical training of staff for silkworm seed multiplication.</li> <li>(3) Technical training of silkworm seed farms.</li> <li>(4) Technical assistance of mulberry cultivation, rearing and reeling in private sector.</li> <li>(5) Development of grading system of both cocoon and raw silks.</li> <li>(6) Establishment of testing facility for cocoon and raw silks grading.</li> </ol>
<b>Extension</b>						
AC-12	Farming Technology Dissemination Project	AEA/NAFRI/STE A	A	Vientiane & Nationwide	To provide farmers and extension workers with improved farming technology information through radio and TV programs.	<ol style="list-style-type: none"> <li>(1) Technical assistance for collection of information/data about farming systems, screening of the information/data, technical advice to field test.</li> <li>(2) Technical assistance for preparation of materials, and processing those materials for broadcast media, and development of TV and radio program for agriculture information, preparation of materials in various written forms.</li> <li>(3) Installation of equipment for TV and radio program.</li> <li>(4) Implementation of TV and radio program and publishing extension materials.</li> <li>(5) Update and amend programs and publications in the light of new information or feedback from the field.</li> <li>(6) Monitor and evaluate the publications' effectiveness and modify if necessary.</li> </ol>

#### 4. Crops; Extension, Research and Others (5/7)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
AC-13	Contract Farming in Intensive Areas (to be combined with AEA extension program)	AEA/DOA	B	AEA, All provinces	To support farmer production groups and cooperatives in dealing with contract farming.	<ol style="list-style-type: none"> <li>(1) Support of contract arrangements between companies and farmers.</li> <li>(2) Provide technical support to companies and farmers in production techniques and farming system.</li> <li>(3) Assist farmers and companies in settlement of dispute arising from contract farming.</li> <li>(4) Provide training to SMS, FSEW and farmers in contract farming methodologies.</li> </ol>
<b>Research related to the above proposed projects</b>						
AC-14	Coffee Cultivation Technology Research Program	Ban Itou Coffee Research Center (CRC)/ NAFRI/ DOA/PAFS/ DAFO	A	Boloven Plateau	To develop modern technology for coffee cultivation to contribute to exports..	<ol style="list-style-type: none"> <li>(1) Technical assistance for implementation of research at CRC as well as experiment field in terms of a) post harvest and quality control, b) agronomy and soil fertility management, c) farming system and economy, d) extension and training, and e) short term experts in various agricultural specialties etc..</li> <li>(2) Technical assistance for establishment of coffee quality standard, installation of equipment for quality test, and implementation of quality test.</li> <li>(3) Implementation of staff training program including on the job training and study tour.</li> <li>(4) Technical assistance for training program for extension staff of PAFS and DAFO as well as model coffee farmers.</li> <li>(5) Technical assistance for implementation of extension activities, establishment of demonstration plots, and monitoring and evaluation of coffee market information.</li> </ol>
AC-15	Vegetable Cultivation Technology Research Program	Horticulture and Vegetable Research Center (HVRC)/ NAFRI/ DOA/PAFS/ DAFO	A	Vientiane & Nation-wide	To select new improved varieties and develop adaptive technologies at field level for vegetable cultivation.	<ol style="list-style-type: none"> <li>(1) Technical assistance for implementation of research at HVRC and provincial stations as well as experiment field in terms of <ol style="list-style-type: none"> <li>a) variety improvement and trial,</li> <li>b) agronomy and soil fertility management,</li> <li>c) plant protection, and</li> <li>d) farming system and economy etc..</li> </ol> </li> <li>(2) Technical assistance on future plan of vegetable research and development, rehabilitation and upgrading plan, design, and cost estimation.</li> <li>(3) Rehabilitation of existing HVRC facilities, upgrading of research stations at provincial level.</li> <li>(4) Implementation of key researcher training including on the job training and oversea training.</li> </ol>

#### 4. Crops; Extension, Research and Others (6/7)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
AC-16	Fruit Cultivation Technology Research Program	Horticulture and Vegetable Research Center (HVRC)/ NAFRI/ DOA/PAFS/ DAFO	A	Vientiane & Nation-wide	To select new improved varieties and develop adaptive technologies at field level for fruit cultivation.	<ol style="list-style-type: none"> <li>(1) Technical assistance for implementation of research at HVRC and provincial stations as well as experiment field in terms of a) selection of crop/variety and trial, b) agronomy and soil fertility management including soil erosion control, c) plant protection, and d) farming system and agro-economy including marketing.</li> <li>(2) Technical assistance on future plan of vegetable research and development, rehabilitation and upgrading plan, design, and cost estimation.</li> <li>(3) Rehabilitation of existing HVRC facilities, upgrading of research stations at provincial level.</li> <li>(4) Implementation of key researcher training including on the job training and oversea training.</li> </ol>
AC-17	Integrated Farming Technology Research Program	NAFRI/DOA	B	Vientiane	To develop integrated farming technologies for market oriented agriculture.	<ol style="list-style-type: none"> <li>(1) Establish an integrated farming system including crop, livestock and fisheries.</li> <li>(2) Establish pilot farms in priority provinces/districts/villages to develop proper integrated farming systems and demonstrate the above results to farmers.</li> </ol>
AC-18	Loa-IRRI Rice Research and Training Project (LIR RTP), Phase 4	NAFRI/DOA/PAFS	S	All rice area in Lao PDR	The objective of Phase 4 is that NRRP is able reach farmers based on its capacity to define, plan, implement, document, monitor and evaluate a program of focused, needs-based adaptive and applied research and development for rice production in both the lowland and upland environment.	Over the past decade, the project has been the principal source of capacity building and technological developments in the rice sector. In order to achieve sustainability of the Lao NRRP, SDC expects greater national capacity to independently plan and implement research and development and thereby reduce its dependence on external experts. In addition, because diversification of financial support to include a role of the government and other donors, Phase 4 will increasingly emphasize the need for additional resources from other donor organizations for specific research and training activities.
AC-19	Mechanized Farming System Research Program	NAFRI	B	Vientiane	To appraise the potential for mechanized in agricultural activities.	<ol style="list-style-type: none"> <li>(1) Undertake an assessment of the current situation of agriculture machine use.</li> <li>(2) Provide the development of mechanized farming using small or local made machine.</li> <li>(3) Assess the potential for the development of large scale mechanized farmer for paddy and cash crops.</li> </ol>
AC-20	Agriculture Machinery performance test criteria	NAFRI	B	Vientiane	To develop a performance test system for agriculture machinery	<ol style="list-style-type: none"> <li>(1) Establish a performance test laboratory with the necessary equipment for agriculture machinery.</li> <li>(2) Provide technical training to the staff in above laboratory.</li> <li>(3) Establish guidelines for performance measurements of agriculture machinery.</li> </ol>



#### 4. Crops; Extension, Research and Others (7/7)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
AC-21	Basic Seed Production Technology Development Project	Agriculture Research Center (ARC)/NAFRI and Napok Seed Multiplication Center/DOA	A	Vientiane	To develop a basic seed production technology including breeding and variety evaluation, breeders' seed production, foundation seed production for cereal crops and beans.	<ul style="list-style-type: none"> <li>(1) Technical assistance on seed development plan, upgrading plan of equipment and cost estimation.</li> <li>(2) Technical assistance for variety evaluation, breeders' seed production and foundation seed production.</li> <li>(3) Installation of new equipment for variety evaluation breeders' seed production and foundation seed production.</li> <li>(4) Technical assistance for staff training including on the job training and oversea training.</li> <li>(5) Technical assistance for establishment of seed multiplication system (Phase II).</li> <li>(6) Technical assistance for training to contract farmers in the seed multiplication center and farmers field (Phase II).</li> </ul>
AC-22	Upland Crop Cultivation Technology Research Program	Agriculture Research Center (ARC)/NAFRI/DOA/PAFS/DAFO	A	Vientiane & Nation-wide	To select new improved varieties and develop adaptive technologies at field level for upland crop cultivation.	<ul style="list-style-type: none"> <li>(1) Technical assistance for implementation of research at ARC and provincial stations as well as experiment field in terms of a) selection of crop/variety and trial, b) agronomy and soil fertility management, c) plant protection, and d) farming system and agro-economy including marketing.</li> <li>(2) Technical assistance on future plan for upland crop research and development, upgrading plan for equipment and stations, design, and cost estimation.</li> <li>(3) Upgrading of equipment in ARC and facilities/equipment of research stations at provincial level.</li> <li>(4) Implementation of key researcher training including on the job training and overseas training.</li> </ul>

## 5. Livestock & Fisheries; Extension, Research and Others (1/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
<b>Livestock Development</b>						
LF-1	Livestock Services and Extension Activities Strengthening (Lao-EU Livestock Project) on-going	MAF/DLF	S	Nationwide	(1) To improve the health conditions of livestock and decrease livestock diseases. (2) To strengthen livestock services related to animal health.	(1) Provide technical assistance on legislation for veterinary service. (2) Improve the vaccine production and distribution systems. (3) Set up marketing information for livestock as well as veterinary disease and animal health information. (4) Strengthen check points information for livestock products as well as DAFO and VVWs for extension on livestock.
LF-2	Animal Health Improvement	MAF/DLF	A	Nationwide	(1) To improve health condition of livestock and to decrease livestock diseases. (2) To strengthen livestock service relating to animal health.	(1) Further expansion of production of National Vaccine Production Institute. (2) Further technical training VVWs and staff of PLFO/DLFO. (3) Strengthen the meat inspection system including check points. (4) Establish a protection system for epidemic disease at the provincial level.
LF-3	Animal Improvement and Breeding System Assistance	MAF/DLF	B	Nationwide	To assist the breeding system in the private sector.	(1) Implement research on animal improvement and undertake adaptability tests on improved animals. (2) Set up legislation for animal improvement and propagation system. (3) Provide technical support to male stock and artificial insemination for breeding for the private sector. (4) Set up a breeding inspection system. (5) Establish a pedigree registration system.
LF-4	Introduction of Animal Insurance System	MAF/DLF	B	Nationwide	To development and introduce an animal insurance system.	(1) Establish the legislation for livestock insurance. (2) Provide technical assistance on financial aspects to develop a livestock insurance system in the private sector.
LF-5	Livestock Productivity Enhancement	MAF/DLF	A	Nationwide	To increase livestock productivity through improvement of animal feed supply.	(1) Improve the animal feed laboratory including the provisional livestock performance test facilities. (2) Establish livestock feeding standards. (3) Improve the district animal centers including the rehabilitation of facilities and the training of staff. (4) Provide improved technology on livestock feed through technical demonstration and training.
LF-6	National Animal Health Center Improvement (Planned by DLF)	MAF/DLF	A	Nationwide	To strengthen the capability of the National Animal Health Center.	(1) Improvement of the animal disease diagnostic laboratory. (2) Establish of four regional level laboratories. (3) Establish a vaccine quality check unit. (4) Provide technical training to staff.
LF-7	Beef and Dairy Cattle Improvement Centers Strengthening	MAF/DLF	B	Namxouang Lat Sen beg Boloven	To enhance research and extension capabilities of dairy cattle improvement centers.	(1) Rehabilitate the centers and install equipment. (2) Implement a training program for staff. (3) Establish and implement training programs for farmers. (4) Develop applicable technology at the regional or provincial levels.

## 5. Livestock & Fisheries; Extension, Research and Others (2/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
LF-8	Research Program of Fodder Crop Production and Sustainable Use of Pasture Land	NAFRI/DOF	B	Vientiane & Nation-wide	(1) To select new improved varieties and develop the proper technology for fodder crop cultivation and post harvest handling / processing. (2) To develop proper and sustainable management systems for pasture land.	(1) Undertake adaptability tests for new fodder crops and varieties and establish proper farming systems including the application effect of fertilizer, weed, disease and insect controls, crop rotation and cropping pattern, and sustainable agriculture. (2) Develop technologies for post harvest storage of fodder crop. (3) Establish pilot farms in priority provinces to show to farmer the above results. (4) Develop sustainable land use system for grazing land.
LF-9	Animal Disease Control Promotion Project in Indochina Region	MAF/DLF	S	Nationwide	To establish regional strategy for animal health and animal disease control.	(1) Provide technical training of government staff in Indo-China region. (2) Implement diagnosis and surveillance for animal diseases. (3) Provide technical assistance on vaccine production and quality control.
<b>Fishery Development</b>						
LF-10	Aquaculture improvement and extension	MAF/DLF	A (S)	Namxouang	To establish the Xamxouang Aquaculture Center and to enhance the capability of counterparts for technology and extension activities in aquaculture.	(1) Set-up and test-operate of facilities at Namxouang Aquaculture Center. (2) Training of counterparts and extension officers. (3) Experiments on methods for fry production and outgrow.
LF-11	Fish Seed Center Rehabilitation/Expansion Project	DLF/PAFSO/DAF SO	A	8 provinces	(1) To rehabilitate and to establish fish seed stations. (2) To strengthen officers in aquaculture technologies and extension activities	(1) Rehabilitation or construction of 8 fish seed centers. (2) Training of officers in aquaculture. (3) Experiments in aquaculture.
LF-12	Rural Aquaculture Development	DLF/PAFSO/DAF SO, Women's Union	A	12 provinces	To develop aquaculture in rural area through the provision of appropriate technologies, equipment, training and funds.	(1) Development of mini-hatchery centers. (2) Extension of aquaculture technologies through communities. (3) Provision of credit for aquaculture. (4) Development of fish feed mills. (5) Marketing promotion of fish through ice production in the rural areas.

## 6. Stabilization of shifting Cultivation; Agro-forestry, NTFPs and Related Livelihood Activities (1/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
SC-1	Stabilisation of Shifting Cultivation (Outside NBCA Areas)					
SC-1.1	Stabilization of Shifting Cultivation in Southern Region.	PAFS/MAF	A	Salavan, Sekong and Attapeu	(1) To stabilize shifting cultivation by the year 2010 through the development of sustainable land-use systems and other income generating activities which are non-hazardous to the environment. (2) To reduce and eliminate the production of illicit drug crops through specifically designed rural development measures in the context of sustained national growth.	(1) Participatory land allocation. (2) Village development planning and extension support. (3) On-farm adaptive farming systems development research agency-linkages. (4) Sustainable management & utilisation of NTFPs. (5) On-farm tree seedling nursery and tree promotion. (6) Monitoring & Evaluation.
SC-1.2	Stabilization of Shifting Cultivation in Northern Region.	LCDC/UNDCP/ Provincial Government PAFS/MAF	A	Huoaphan, Phongsali, Luang Namtha, Luang Prabang, Oudomxai	(1) To stabilize shifting cultivation by the year 2010 through the development of sustainable land-use systems and other income generating activities which are non-hazardous to the environment. (2) To reduce and eliminate the production of illicit drug crops through specifically designed rural development measures in the context of sustained national growth.	(1) Physical infrastructure - roads, water supply, sanitation & small scale irrigation. (2) Social Infrastructure - gender responsive approaches for community development, health, education and vocational training. (3) Food security and income generation - sustainable land-use development, livestock, forestry, eco-tourism, income diversification and credit.
SC-1.3	Upland development and Poverty Alleviation Programme.	MAF/Sida	A	<i>To be finalised possibly:</i> L. Prabang, Sayabouri & Savanakhet	To be defined during appraisal / preparation Likely to include poverty alleviation and sustainable land-use systems and use of natural resources.	To be defined during appraisal / preparation.
SC-2	Stabilization of Slash and Burn inside in NBCAs.	DoF/MAF	A	Priority NBCAs under threat from Shifting Cultivation	To stabilise shifting cultivation and promote sustainable utilisation of forest and other natural resources within community utilisation zones in the target prioritised NBCAs. <i>Phou Phanang, Nam Kading, Dong Phou Vieng, Xe Sap, Dong Amphan, Nam Xan, Nam Phoui, Nakai Nam Theun and Phou Hin Poun.</i>	(1) Participatory land-use planning and zoning - NBCA methodology. (2) Village development planning and extension support. (3) Sustainable management & utilisation of NTFPs. (4) Monitoring & Evaluation.
SC-3	On-farm Agro-Forestry Research for Sustainable Upland farming Systems.	NAFRI/DoF & Target Villages PAFS/DAFS	A	Target Villages PAFS/DAFS	To develop and establish area-based agro-forestry models of appropriate sustainable land-use based on biophysical and agro-climatic situations.	(1) Review of completed and ongoing projects concerned with agro-forestry. (2) Extension linkage support system for on-farm agro-forestry systems development. (3) Monitoring & evaluation of socio-economic impacts.

## 6. Stabilization of shifting Cultivation; Agro-forestry, NTFPs and Related Livelihood Activities (2/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
SC-4	Research on Sustainable Management and Utilisation of NTFPs.	NTFP Unit/ FRC/NAFRI MAF	A	Oudomxai, Salavan and Champasak	To develop and promote sustainable harvesting management and utilisation of NTFPs.	(1) NTFP Inventories. (2) NTFP Utilisation & Management. (3) NTFP Domestication. (4) Monitoring & Evaluation.
SC-5	NTFP Management and Conservation.	NAFRI	B	Nationwide	(1) To support NTFP sustainable commodity production. (2) Human resources development.	(1) Sustainable NTFP management research. (2) NTFP Inventories development. (3) NTFP Domestication studies & development.
SC-6	Agro-forestry & Sustainable Land-use Demonstration	NAFRI/MAF	B	Shifting cultivation areas, nation-wide	(1) To extend agroforestry demonstrations to all major areas of shifting cultivation. (2) To provide demonstrations of location appropriate agroforestry systems for arable, pastoral and mixed farming.	(1) Research / Regional Training Center / Extension linking. (2) Staff training. (3) Agro-climatic zone site specific agro forestry demonstration design and establishment. (4) Monitoring, evaluation and reporting of demonstration progress and community interest/uptake of information generated.
SC-7	Networking Technologies and Methodologies in Upland Farming Systems and Livelihood Development.	SSCP/DoF MAF	B	Target Villages PAFS/DAFS	(1) To provide network linkage between upland projects for interchange of information and experiences in relation to stabilisation of shifting cultivation and development of sustainable farming systems and off-farm income generating opportunities. (2) To undertake progress monitoring and evaluation of shifting cultivation stabilisation and upland community socio-economic status.	Components are for information networking and socio-economic M&E of the shifting cultivation stabilisation process. (1) Land-use Planning and Allocation. (2) Farming Systems. (3) Trees on Farms & NTFPs. (4) Socio-economic Monitoring & Evaluation.

## 7. Marketing and Agro-processing (1/3)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
MR-1	Food Hygiene Inspection System	DOL/DOA/NAFRI	B	Vientiane & Nationwide	To establish a food hygiene standards and to establish a food hygiene inspection system.	<ol style="list-style-type: none"> <li>(1) Study on the present conditions and constraints of relevant institutions dealing with food hygiene.</li> <li>(2) Improve regulations and relevant laws.</li> <li>(3) Improve laboratory and relevant equipment for food hygiene.</li> <li>(4) Introduce food inspection systems including regular inspection and registration.</li> <li>(5) Technical training for inspection staff.</li> <li>(6) Technical advice on hygiene and quality control systems for processing facilities.</li> </ol>
MR-2	Agricultural Commodity Market Intelligence Project	Economics and Marketing Unit (EMU), DOA	A	Vientiane & Nationwide	<ol style="list-style-type: none"> <li>(1) To collect and disseminate commodity market information on output and input prices and product in a standardized format;</li> <li>(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</li> <li>(3) To provide data to agribusiness sector participants on the seasonality of production, market flows and the price determination process throughout the production cycle.</li> </ol>	<ol style="list-style-type: none"> <li>(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.</li> <li>(2) Training of provincial EMU staff and refresher course for SMSs and central EMU staff.</li> <li>(3) General and direct operating expenses. and</li> <li>(4) MIS operation equipment that includes renewal of 5 computer systems provided by the ongoing project and additional 2 computer systems for MIS expansion.</li> </ol>
MR-3	Farmers Groups for Agriculture Production (T/A)	DOA/MOCT	B	Vientiane & Nationwide	To encourage farmers to have greater bargaining powers.	<ol style="list-style-type: none"> <li>(1) Establish of regulation on farmers' organization for tradings.</li> <li>(2) Prepare model by-laws.</li> <li>(3) Provide training for institutional and financial management.</li> <li>(4) Coordinate with rural finance and rural road construction.</li> <li>(5) Technical training for groups on shipping, quality control and grading standardization.</li> </ol>
MR-4	Agricultural Products Grade and Classification Project	DOP with cooperation of DOA and DLF	A	Vientiane & Nationwide	<ol style="list-style-type: none"> <li>(1) To develop a system of grades and classification for agricultural commodities that are widely accepted by producers, traders, and consumers, both domestically and internationally.</li> <li>(2) To facilitate trade and commerce through sight unseen trading.</li> <li>(3) To assist in standardization of transport, packaging, cold storage and processing.</li> <li>(4) To expand domestic and international trade.</li> </ol>	<ol style="list-style-type: none"> <li>(1) Studies and surveys, including surveys of product characteristics and attributes in Lao PDR as well as evaluating the grading systems in Thailand and the preferences of buyers and consumers in neighboring countries.</li> <li>(2) Selection of important commodities and pilot testing of grade and classification systems.</li> <li>(3) Enhancement of organization for inspection, and implementation of the grainge system.</li> <li>(4) A training program for staff administering the system.</li> <li>(5) Monitoring and evaluation of the grades and classification system.</li> </ol>

## 7. Marketing and Agro-processing (2/3)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
MR-5	The Regulatory Framework Based on a Market-friendly and Commercial Approach (T/A)	MOCT	B	Nationwide	Support market driven rural development by rationalizing official statutory framework by bringing regulations into line with current agro-economic environment.	(1) Revise or remove laws and regulations that restrict market driven agriculture and agro-based economic activities. (2) Revise or remove laws and regulations that requires time consuming procedures for approving new business and private enterprise.
MR-6	Post-Harvest and Agro-Processing Technology Center	NAFRI/DOA	B	Vientiane	(1) To establish the technology center for post-harvest and agro-processing including quality control, processing, sorting, storing and packing. (2) To provide technical support to small business enterprise.	(1) Establish center with necessary equipment and apparatus. (2) Technical training for staff. (3) Development of technical training program for small business enterprises. (4) Provide a service for quality evaluation of post harvest or agro-processed products. (5) Develop appropriate technology of post-harvest and agro-processing including quality control, sorting, packing and storing. (6) Provide training to small business enterprise for post-harvest and processing in both the Technology Center and at the field level. (7) Coordinate with micro-credit programs to establish post harvesting and agro-processing facilities and equipment for small business enterprise.
MR-7	Study of the Export Potential and Inputs Supply of Agricultural Commodities  (to be continued)	DOA/DOP/ MOCT	A	Nationwide, and neighboring countries (China, Thailand, Vietnam, Singapore, Cambodia, Myanmar)	To study marketing opportunities for export/import of agricultural commodities.	(1) To review the FAO and JICA marketing Studies. (2) To study the agricultural marketing conditions in target countries for the following aspects: i) general agricultural marketing conditions for the main agricultural commodities, ii) marketing channels for the main agricultural commodities, iii) import/export restrictions for the main agricultural commodities, iv) packing, freight and quarantine requirements, v) marketing positions and SWOT analysis of respective Lao products, vi) consumption characteristics of each agricultural product in the target countries, vii) market demand characteristics, product specifications and sources of supply, viii) import/ export of the main agricultural commodities, ix) seasonal price fluctuations of the main agricultural commodities.

## 7. Marketing and Agro-processing (3/3)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
MR-7	(continuation) Study of the Export Potential and Inputs Supply of Agricultural Commodities	DOA/DOP/ MOCT	A	Nationwide, and neighboring countries (China, Thailand, Vietnam, Singapore, Cambodia, Myanmar)	To study marketing opportunities for export/import of agricultural commodities.	<ul style="list-style-type: none"> <li>(3) Conduct test marketing of selected Lao products with market potential and to analyze the results.</li> <li>(4) Improve the capabilities of government officers through training in marketing.</li> <li>(5) Exchange of views and information through field trips and seminars with other development projects, institutions and extension organizations related to agricultural marketing.</li> <li>(6) Make a strategic master plan to improve the export/import of agricultural commodities.</li> </ul>
MR-8	Processing and Marketing of Non Timber Forest Products (NTFPs)	DOF/DOP/MOCT	A	NTFP Research Division, FRC, NAFRI and implemented through three existing NTFP Support Centers in Oudomxai, Salavan and Champasak provinces.	<ul style="list-style-type: none"> <li>(1) To identify key NTFPs and develop market knowledge and improve marketing strategies and guidelines.</li> <li>(2) To undertake pilot testing based on developed guidelines.</li> <li>(3) To identify processing opportunities and provide recommendations to guide development of the processing sector.</li> </ul>	<ul style="list-style-type: none"> <li>(1) Identification of target NTFPs for focused attention.</li> <li>(2) Identification where processing and/or marketing capabilities require developing or strengthening and provide guidelines, including on-the-job training for local artisans.</li> <li>(3) Undertaking marketing surveys and trials including an evaluation of legal and procedural impediments with recommendations to overcome these impediments.</li> <li>(4) Undertaking market expansion where a potential has been identified within an assessed harvesting capacity at identified sites.</li> <li>(5) Monitoring and evaluating the environmental and socio-economic impacts.</li> <li>(6) Preparation of a proposal for the required project components and assistance for the future period.</li> </ul>
MR-9	Wholesale Market Development Project	MOCT	A	Vientiane Municipality, Louangphrabang Province and Savannakhet Province	To provide facilities for exchange and trade of commodities, including perishables, at the wholesale level in major cities and thereby <ul style="list-style-type: none"> <li>(i) provide traders and farmers better marketing opportunities;</li> <li>(ii) enable locate buyers and sellers, transport links; and the major markets; and</li> <li>(iii) facilitate market clearance and reduce losses in perishables trade through wholesale activities</li> </ul>	<ul style="list-style-type: none"> <li>(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.</li> <li>(2) Technical assistance for improvement of wholesale market regulation, operation and management for wholesale market system.</li> <li>(3) Rehabilitation or construction of wholesale market facilities.</li> <li>(4) Implementation of training program for staff in wholesale market and government staff related to wholesale market.</li> </ul>



## 8. Rural Finance (1/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
RF-1	In-service Training of SOCB Staff and the Expansion of the Training Center	Ministry of Finance	A	Vientiane & Nationwide	(1) To establish an effective operation and management system in each SOCB. (2) To establish A systematic training system for SOCB staff.	(1) Develop of curricula for training and re-training courses. (2) Training for trainers courses.
RF-2	SOCBs Operational Performance Improvement and Extension of Branch Banking	Ministry of Finance	A	Vientiane & Nationwide	To review and evaluate the performances of SOCB after the introduction of a series of improvement measures, covering the banch banking	Recommend specific measures to be taken to improve performance based on the evaluation & creation of branches.
RF-3	Introduction of a Deposit Protection Scheme and Credit Information Bureau (T/A). Completed in March/April 2001	Ministry of Finance	S	Vientiane	To accelerate the domestic saving through the efficient operation of banks and offer consumer credit information to prospective lending agencies.	Create new laws and regulations regarding deposit protection and consumer credit information.
RF-4	Legislation for Debt Recovery and Security Enforcement, the Legal Basis for Bills of Exchange and Promissory Notes and Leasing (T/A). Under process.	Ministry of Finance	B	Vientiane	To promote the efficient operation of banks as well as to protect the individuals and enterprises from bad debt.	Create of laws and regulations regarding debt recovery, bills of exchange and leasing.
RF-5	Continuation and Expansion of Credit and Saving Groups	Ministry of Finance	B	Vientiane & Nationwide	To increase the cash income and savings of village people through credit and saving groups.	Establish credit & saving groups through transformation of VRFs.
RF-6	SOCBs Loan Packages Development for Livestock and Fishery (pilot project)	SOCB	B	Vientiane & Nationwide	To diversify the financing sources for agriculture enterprises.	Prioritization of the sub-sector and tailor loan product accordingly.
RF-7	APB Diagnostic Study (T/A)	Bank of Lao PDR	S	Vientiane	To review and evaluate the performances of APB.	Study operations of APB to establish better viable banking.
RF-8	Expansion of Credit to Farmer Groups by APB	APB	A	Vientiane & Nationwide	To encourage farmers' production on a commercial basis.	Increase credit disbursement to farmer groups.
RF-9	APB Restructuring and Reorganization on the Recommendations of Diagnostic Study	MOF	A	Vientiane	To implement APB diagnostic study.	(1) Revise organizational structure. (2) Revise lending policy. (3) Revise accounting practices. (4) Revise deposit legislation policy.
RF-10	SOCB's Further Expansion of Rural Banking, Deposit Mobilization and Mobile Credit Scheme	SOCB	B	Vientiane & Nationwide	To reach borrowers in remote and distant areas.	Mobile credit officer scheme, establish new branches and increase lending and savings.

## 8. Rural Finance (2/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
RF-11	Extension and Expansion of Activities in the UNDP/CDF Microfinance Training Center to All Provinces	Ministry of Finance	A	Vientiane & Nationwide	To establish systematic supporting system for farmers regarding rural finance, credit delivery, and deposit mobilization.	Training courses to members of VRFs, saving & credit groups, and NGOs.
RF-12	SOCB's Expansion of Credit to Farmers and Agribusiness.	SOCB	B	Vientiane & Nationwide	To diversify the financing sources for rural farmers and enterprises as well to revitalize the local economy.	Intensify MCO activity and branch network through loan delivery and saving mobilization target campaigns.
RF-13	Expansion of Microfinance Credit and Savings Groups, Financial Deepening and Conversions of All VRFs to Saving and Credit Groups	Ministry of Finance	B	Vientiane & Nationwide	To transform informal finance to institutional finance.	Training courses on saving & credit, group formation, T/A on conversion to saving & credit group.

## 9. Rural Development (RD) (1/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
RD-1	Village-led Agriculture Development Initiative in Remote Rural Area (VADIRRA) -Phase I consisting of three sub-projects	PAFS/DAFO in each province and concerned agencies	A	Nationwide	(1) To promote market-oriented agriculture in remote rural areas through village initiative, and (2) To increase living standards and reduce poverty in remote villages through agricultural development.	(1) Technical assistance for the development study and participatory survey in which village agricultural development plan initiative 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 implementing village based small-scale projects, (6) General and direct operating expenses. (7) Equipment including motorcycles and computers for extension services.
	(1) VADIRRA in Champasak, Attapu, Saravan and Xekong provinces; 100 villages					
	(2) VADIRRA in Khammouan and Savannakhet provinces; 100 villages					
	(3) VADIRRA in Vientiane Mun., Vientiane and Borikhamxai provinces; 100 villages					
RD-2	Village Initiative Agriculture Development in Remote Rural Area (VADIRRA) -Phase II	PAFS/DAFO in each province and concerned agencies	B	Nationwide	(1) To promote market-oriented agriculture in remote rural areas through village initiative, and (2) To increase living standards and reduce poverty in remote villages through agricultural development.	The project components will be the same as that in Phase I.
	(1) VADIRRA in Xaisomboun and Xiangkhouang provinces; 100 villages					
	(2) VADIRRA in Xaignabouri, Louangphrabang and Houaphan provinces; 100 villages					
	(3) VADIRRA in Oudomxai, Bokeo, Louangnamtha and Phongsaly provinces; 100 villages					

## 9. Rural Development (RD) (2/2)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
RD-3	Integrated Agricultural and Rural Development Project in Boloven Plateau	Champasak, Saravan and Xekong PAFS/Ban-Itou Coffee Research Center, NAFRI/DAFO	A	Boloven Plateau located in Champasak, Saravan and Xekong provinces	To increase framing output through improvement and development of road, irrigation, drainage, and other infrastructures together with appropriate agricultural support services.	<ol style="list-style-type: none"> <li>(1) Technical assistance for detail design and construction.</li> <li>(2) Technical assistance for management of NAFRI, agriculture development such as extension, water management, marketing management, and monitoring and evaluation.</li> <li>(3) Rehabilitation of market access roads.</li> <li>(4) Construction of demonstration farms and NAFRI satellite offices.</li> <li>(5) Construction of irrigation and drainage system.</li> <li>(6) Construction of social infrastructure.</li> </ol>
RD-4	Area-based Integrated Rural Development Program-Phase I	RDC/RDO in each province and SPC/LCRD	A	Nationwide A total of 1,500 villages will be covered.	To alleviate rural poverty and improve the livelihood of the rural population through improvement/development of rural infrastructure/facilities.	<ol style="list-style-type: none"> <li>(1) Consultant services for training of central and local staff and assistance in development planning, design, construction supervision, and monitoring &amp; evaluation.</li> <li>(2) Training staff in CLCRD, PLCRDs/PRDOs and in relevant district offices in rural participatory surveys, project planning and implementation, and project monitoring &amp; evaluation.</li> <li>(3) Equipment (motorcycles) for the fieldwork to be carried out by the staff in PRDCs/PRDOs and relevant district offices.</li> <li>(4) In-country travel costs for the CLCRD staff and consultants.</li> <li>(5) Financial support for staff field allowances in CLCRD, PLCRDs/PRDOs and relevant district offices for conducting the fieldwork.</li> </ol>
RD-5	Area-based Integrated Rural Development Program-Phase II	RDC/RDO in each province and SPC/LCRD	B	Nationwide A total of 1,500 villages will be covered.	To alleviate rural poverty and improve the livelihood of the rural population through improvement/development of rural infrastructure/facilities.	The project components will be the same with that in Phase I. However, Phase II will be carried out by the Government by allocating their own budget and through the staff trained during Phase I.

## 10. Irrigation (1/3)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
IR-1	Community Managed Irrigation Sector Project-2 (CMISP-2)	DOI/MAF	A	Northern Region as listed below; Louangphrabang Xaignabouri Phongsali Bokeo Louangnamtha Oudomxai	<ol style="list-style-type: none"> <li>(1) To increase agricultural production on a sustainable basis.</li> <li>(2) To increase food security and incomes.</li> <li>(3) To improve watersheds by reducing shifting cultivation and promoting tree planting in northern rural area through Irrigation Management Transfer (IMT) process.</li> </ol>	<ol style="list-style-type: none"> <li>(1) Select priority projects from respective Province.</li> <li>(2) Mobilize community to project activities.</li> <li>(3) Rehabilitate and develop community managed irrigation schemes.</li> <li>(4) Construct rural infrastructure including rural water supplies and district feeder roads.</li> <li>(5) Institutional and financial support including setting up of Village Development Fund (VDF) for CMI development.</li> <li>(6) Support for income generating activities</li> </ol>
IR-2	Decentralized Irrigation Development and Management Project (DIDMP) (ADB and France financed)	DOI/MAF	S	Borikhamxai, Vientiane Mun., Savannakhet, Louangphra- bang, Xaignabouri	To facilitate the full the transfer of irrigation schemes to the farmers as pilot schemes	<ol style="list-style-type: none"> <li>(1) Assisting users, through WUAs to organize themselves to participate in the rehabilitation, and O&amp;M of irrigation systems.</li> <li>(2) Provide appropriate extension services to farmers.</li> <li>(3) Rehabilitate existing schemes in cooperation with WUA.</li> <li>(4) Provide capacity enhancement to PAFSSs and DAFOs.</li> <li>(5) Provide gender initiatives in development programs.</li> <li>(6) Support VDF process for cost recovery.</li> </ol>
IR-3	Agriculture Development Project (ADP) (WB financed)	DOP/MAF	S	Champasak, Khammouan, Saravane, Attapu	<ol style="list-style-type: none"> <li>(1) To enhance agricultural productivity, and to encourage crop diversification and thereby increase overall agricultural production.</li> <li>(2) To target small and low income subsistence farmers, so as to improve smallholder food security and increase rural incomes in a sustainable manner.</li> </ol>	<ol style="list-style-type: none"> <li>(1) Rehabilitate irrigation facilities.</li> <li>(2) Construct and rehabilitate village access tracks.</li> <li>(3) Construct village water supply facilities.</li> <li>(4) Establish Village Investment Funds (VIF).</li> <li>(5) Enhance agricultural services for institutional strengthening.</li> <li>(6) Project implementation support</li> </ol>
IR-4	TA on Accelerated IMT	DOI/MAF	A	Nationwide	<ol style="list-style-type: none"> <li>(1) To establish a data base on existing irrigation schemes,</li> <li>(2) To establish a data base on potential community managed irrigation schemes,</li> <li>(3) To provide the necessary information and recommendations for accelerating and supporting Irrigation Management Transfer (IMT) process.</li> </ol>	<ol style="list-style-type: none"> <li>(1) Inventory of existing irrigation schemes covering natural and human resources conditions, constraints and needs for improvement in agricultural production, irrigation area, facility conditions, farmers' organization activities, rehabilitation needs and costs, and other necessary information.</li> <li>(2) Inventory of potential community managed irrigation schemes covering natural and human resources conditions, agricultural production, irrigable area, development needs and costs, and other necessary information.</li> <li>(3) Review and recommend schemes for management systems including improved O&amp;M, capacity building of WUA, education and training of WUA members, IMT process and VDF management, etc.</li> <li>(4) Prioritize existing schemes to be rehabilitated and improved and potential schemes to be developed, and prepare short-medium-long term implementation programs.</li> </ol>

**10. Irrigation (2/3)**

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
IR-5	Community Managed Small Scale Irrigation Project	DOI/MAF	A	Nationwide	(1) To increase agricultural productivity through encouraging crop diversification and thereby increase overall agricultural production on a sustainable basis. (2) To increase food security and income. (3) To improve watersheds by reducing shifting cultivation and promoting tree planting and management in mountain area.	(1) Assisting users, through WUAs to organize themselves to participate in the rehabilitation or new construction, and O&M of irrigation systems. (2) Provide appropriate extension services to farmers. (3) Rehabilitate existing schemes in cooperation with WUA. (4) Construct new irrigation schemes on a community participation basis. (5) Implement IMT. (6) Provide capacity enhancement to PAFSs and DAFOs. (7) Provide systematic gender initiatives in development programs. (8) Support the VDF process for cost recovery.
IR-6	TA of Water Resources Development in Northern and Central Region	DOI/MAF	B	Northern and Central Region	To provide technical solutions and investment processes to stabilize rural agriculture and other sectors in Northern and Central Regions, ensuring the provinces sufficient food in some areas and the accumulation of surpluses in other areas.	(1) Study irrigation water resources, domestic water resources, flood control, and the environment in Northern and Central Regions. (2) Prioritize the Project and prepare the implementation schedule
IR-7	TAs for Best Irrigation Use of Exploited Water Resources for Diversified Agriculture Development Projects	DOI/MAF	B	Nationwide	(1) To increase agricultural productivity, encourage crop diversification and thereby increase overall agricultural production on a sustainable basis, (2) To increase food security and incomes through intensive farming systems.	(1) Development study on medium and large scale irrigation schemes in cooperation with communities through best utilization of exploited/exploitable water resource development projects such as hydropower, water supply, flood control, etc. (2) Study on the provision and construction of flood protection facilities for sustainable use of flood prone area. (3) Review and recommend management systems including improved O&M, capacity building of WUA, education and training of WUA members, IMT process and VDF management, etc. (4) Study for the provision of appropriate extension services to farmers. (5) Study of capacity enhancement to PAFSs and DAFOs.

## 10. Irrigation (3/3)

No.	Project/Program Title	Executing Agencies	Phasing	Location	Objective	Component
IR-8	Best Irrigation Use of Exploited Water Resources for Diversified Agriculture Development Projects	DOI/MAF	B	Nationwide	(1) To increase agricultural productivity, encourage crop diversification and thereby increase overall agricultural production on a sustainable basis. (2) To increase food security and incomes through intensive farming systems.	(1) Rehabilitation and construction of medium and large scale irrigation schemes in cooperation with the community. (2) Provision and construction of flood protection facilities for sustainable use of flood prone area. (3) Rehabilitation of existing schemes in cooperation with WUA. (4) Implementation of IMT. (5) Provide appropriate extension services to farmers. (6) Provide capacity enhancement to PAFSs and DAFOs. (7) Support gender initiatives in development programs. (8) Support VDF management for sustainable project management.
IR-9	Groundwater Irrigation Development and Management	DOI/MAF	B	Nationwide	To promote high valued commodity crops by best use of groundwater resources.	(1) Investigation of groundwater potential. (2) Provide pilot groundwater irrigation schemes. (3) Extend groundwater irrigation schemes link to rural development programs.
IR-10	Technical Cooperation for Upland Crop Irrigation Engineering Center	DOI/MAF	B	Southern Region	To extend research institutions to upland irrigated crops.	(1) Construction of an upland crops irrigation engineering center and pilot areas. (2) Provide necessary data and research for the development of upland crop farming. (3) Establish training curricula to train concerned staff and farmers.
IR-11	Flood Disaster Mitigation	DOI/MAF	A	Flood-prone Area along Mekong Tributaries as listed below; Vientiane mun. Borikhamxai Khammouan Savannakhet Saravan Champasak	To secure agricultural production and properties at flood-prone area along tributaries of Mekong River from wet season flooding	(1) Detail assessment of damaged area by wet season flooding. (2) Selection of priority area. (3) Planning of flood mitigation measures such as flood protection dike, flood control gate, drainage pump and other conceivable effective measures. (4) Rehabilitation and upgrading of flood protection facilities. (5) Rehabilitation and upgrading of existing river observatory system