

Japan International
Forestry
Cooperation Agency
Republic
(JICA)

Ministry of Agriculture and
Lao People's Democratic

MASTER PLAN STUDY
ON
INTEGRATED AGRICULTURAL DEVELOPMENT
IN
LAO PEOPLE'S DEMOCRATIC REPUBLIC

VOLUME I
MAIN REPORT

OCTOBER 2001

Nippon Koei Co., Ltd.
KRI International Corp.

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LIST OF REPORTS

VOLUME I MAIN REPORT

VOLUME II PROFILES FOR PRIORITY PROJECTS AND PROGRAMS

VOLUME III APPENDICES

- Appendix 1 Scope of Work and Minutes of Meeting
- Appendix 2 Socio-Economy and Government Strategies of Agricultural Development
- Appendix 3 Administration, Government Finance and Institution
- Appendix 4 Meteo-hydrology and Water Resource
- Appendix 5 Land and Forest Resources
- Appendix 6 Field Crops
- Appendix 7 Livestock and Fisheries
- Appendix 8 Shifting Cultivation, Agro-forestry, NTFPs and Related Livelihood Activities
- Appendix 9 Agriculture Supporting Services
- Appendix 10 Human Resources Development
- Appendix 11 Rural Finance
- Appendix 12 Marketing and Agro-Processing
- Appendix 13 Rural Development
- Appendix 14 Irrigation Development
- Appendix 15 Social Aspects in Agriculture and Rural development
- Appendix 16 International Cooperation and Assistance
- Appendix 17 Study on Priority Schemes in Boloven Plateau Agriculture and Rural Development Project
- Appendix 18 Environmental Issues
- Appendix 19 Past and Current Agricultural Development Projects
- Appendix 20 Website for the Master Plan Study on Integrated Agricultural Development in Lao PDR

CURRENCY EQUIVALENTS

US\$ 1.00 = Kip 8,220 = ¥ 114 as of 29th December 2000

PREFACE

In response to the request from the Government of the People's Democratic Republic of Lao (Lao PDR), the Government of Japan decided to conduct the Master Plan Study on integrated Agricultural Development and entrusted the study to Japan International Cooperation Agency (JICA).


JICA sent to Lao PDR the study team headed by Mr. Yutaka Murai, Nippon Koei Co., Ltd., three (3) times between November 2000 and September 2001.

The team held discussions with the officials concerned of the Government of Lao PDR, and conducted field survey and investigation in the study area. After the team returned to Japan, further studies were made and this report was prepared.

I do hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Lao PDR for their close cooperation extended to the team.

October 2001



Takao KAWAKAMI

The President of

Japan International Cooperation Agency

October 2001

Mr. Takao KAWAKAMI
The President
Japan International Cooperation Agency
Tokyo, Japan

Dear Sir,

LETTER OF TRANSMITTAL

We have the pleasure of submitting herewith the report on Master Plan Study on Integrated Agricultural Development in Lao People's Democratic Republic.

The Study was conducted by Nippon Koei Co., Ltd. in association with KRI International Corporation over a 12-month period from November 2000 to October 2001 under a Contract with JICA. The purpose of the Study is to formulate a long term Action Plan for the agricultural development in Lao PDR towards the year 2020. The Study therefore covered all the aspects of agricultural sub-sectors and the related areas that constitute the agriculture in Lao PDR. As a result, the Study formulated an Action Plan with identifying all the required projects and programs that are conceivable at present. In the course of the Study, we identified all the present agriculture conditions down to the regional level through the statistical and GIS analysis using the latest agro- and socio-economic data available. In addition, the results of analyzed present conditions and rationale of the Action Plan were reviewed and confirmed by close dialogues with representatives of international donor agencies in Lao PDR as well as the Ministry of Agriculture and Forestry and government agencies concerned through a series of workshops held centrally and locally.

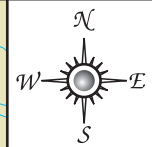
An aim of the Study was to present a report that could be commonly used by the international donor agencies including the Government of Japan. We believe this has been achieved. We hope that the Government of Lao PDR will implement the projects and programs proposed in the Action Plan, following the priorities and factors presented in this report as the major guidelines.

Finally, we take this opportunity to convey our deep appreciation and sincere gratitude to the personnel concerned of your Agency, the Embassy of Japan in Lao PDR, JICA's Laos office, the Ministry of Agriculture and Forestry and the resident offices of international donor agencies for the courtesies and cooperation extended to us during the field studies.

Very truly yours,

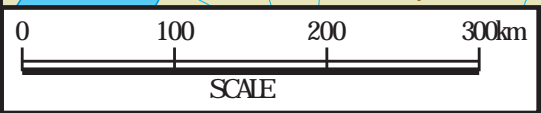
村井 浩

Yutaka MURAI
The Leader of the Study Team of the
Master Plan Study on Integrated
Agricultural Development in Lao PDR

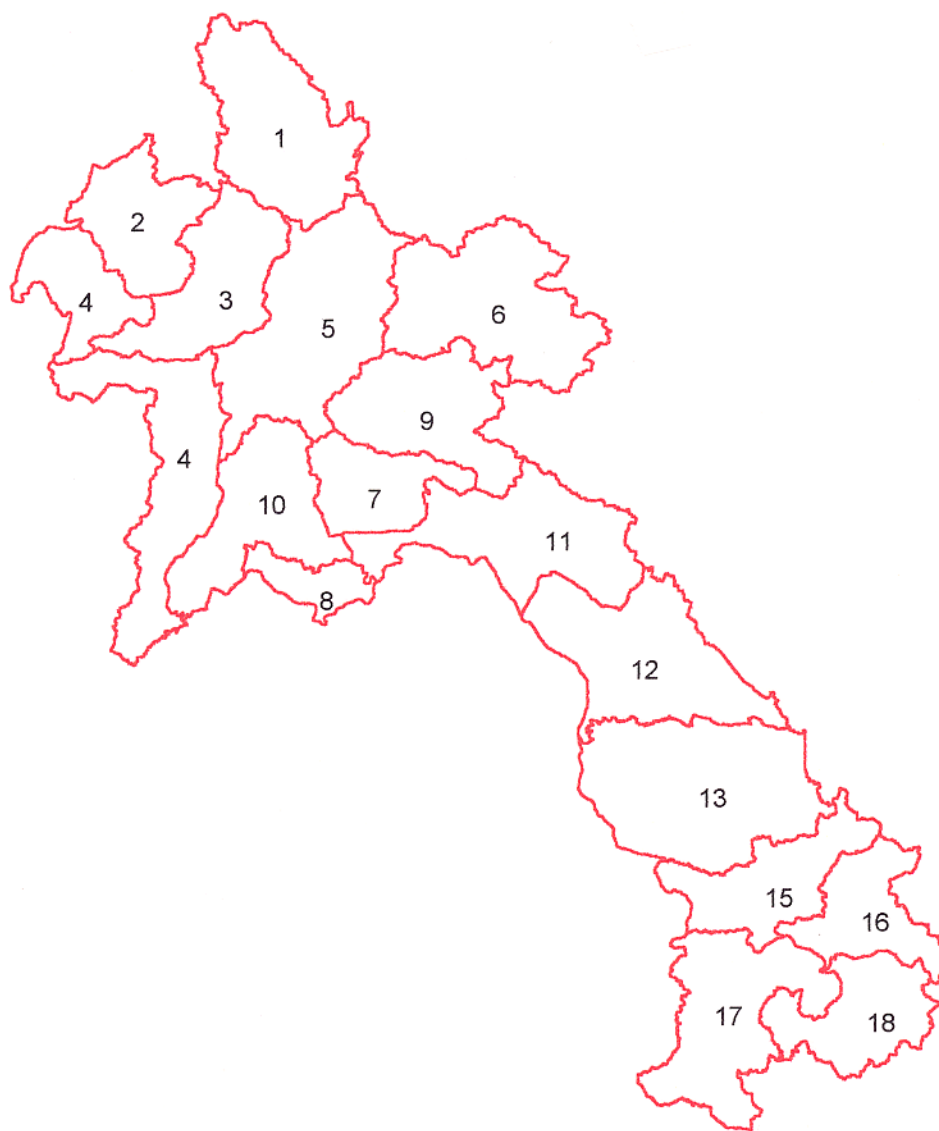


Legend

- National Boundary
- - - Provincial Boundary
- == Road
- ~ River
- Lake
- □ ● Major Town



MAP OF LAO PDR



Northern Region

No.	Name	Area (km ²)	Population (Thousand)
1	Phongsali	15,896	174
2	Louangnamtha	9,871	131
3	Oudomxai	12,121	240
4	Bokeo	7,183	130
5	Louangphrabang	20,524	416
6	Houaphan	18,007	279
7	Xaignabouri	7,923	333
Northern Region Total		91,525	1,703

Central Region

No.	Name	Area (km ²)	Population (Thousand)
8	Vientiane Mun.	3,686	608
9	Xiangkhouang	13,067	229
10	Vientiane Pro.	12,940	327
11	Borikhamxai	16,146	187
12	Khammouan	17,187	311
13	Savannakhet	21,992	766
14	Xaisomboun S/R	15,971	62
Central Region Total		100,989	2,490

Southern Region

No.	Name	Area (km ²)	Population (Thousand)
15	Saravan	10,445	292
16	Xekong	8,629	73
17	Champasak	15,396	572
18	Attapu	9,816	100
Southern Region Total		44,286	1,037

	Area (km ²)	Population (Thousand)
Total	236,800	5,230

ADMINISTRATIVE DATA (As of November 2000)

Photographs of Present Agricultural and Rural Development in Lao PDR (1/4)



Ministry of Agriculture and Forestry (MAF)
Headquarters (Vientiane Municipality)



Provincial Agriculture and Forestry Services (PAFS)
(Vientiane Province)



District Agriculture and Forestry Office (DAFO)
(Saitany District in Vientiane Municipality)



Land Titling Project
(Louangphrabang Province)



Irrigation Training Center
(Vientiane Municipality)



Rice Seed Multiplication Center
(Savannakhet Province)

Photographs of Present Agricultural and Rural Development in Lao PDR (2/4)



Paddy Field in
Community Managed Irrigation Sector Project (CMISP)
(Vientiane Province)



Sericulture Research Center
(Vientiane Municipality)



Cattle Breeding
(Vientiane Province)



Small Scale Poultry Farming
(Louangphrabang Province)



Small Scale Fish Culture
(Vientiane Province)



Shifting Cultivation and Lowland Paddy in
Northern Mountainous Area
(Oudomxai Province)

Photographs of Present Agricultural and Rural Development in Lao PDR (3/4)



Rural Market
(Khammouan Province)



Headquarters of Agriculture Promotion Bank (APB)
(Vientiane Municipality)



Rural Road
(Champasak Province)



Rural Water Supply Facilities
(Louangphrabang Province)



Canal Construction by Farmers' Participation
(Oudomxai Province)



Headworks constructed by
Community Managed Irrigation Sector Project (CMISP)
(Xiangkhouang Province)

Photographs of Present Agricultural and Rural Development in Lao PDR (4/4)



Irrigation Pump on Pontoon provided by National Pump Installation and Management Program (NPIMP) (Savannakhet Province)



Flood Protection Dike (Savannakhet Province)



Orientation Workshop at MAF Head Office (Vientiane Municipality) (12 December 2000)



Provincial Workshop for Southern Region (Champasak Province) (30 January 2001)



First Central Workshop (Vientiane Municipality) (1 March 2001)



Second Central Workshop (Vientiane Municipality) (30 August 2001)

SUMMARY

1. Introduction

Background and Objectives

- 1.1 This Report presents the study results of the "Master Plan Study on Integrated Agricultural Development in Lao People's Democratic Republic" (the Study), carried out in accordance with the Scope of Work for the Study (S/W) agreed between Japan International COOPERATION Agency (JICA) and the Ministry of Agriculture and Forestry (MAF), the Government of Lao PDR (GOL) dated June 30, 2000.
- 1.2 Agriculture in Lao People's Democratic Republic (Lao PDR) dominates the country's economy, providing 52% of GDP of which per capita for 1997 is an estimated US\$400 and absorbing 80% of the labor force. Agriculture in Lao PDR is characterized by three main farming systems: dry-land rice cultivation by shifting cultivation in the northern and eastern mountain regions; paddy rice cultivation along the Mekong River and the cultivation of horticulture products in the southern highland region. Although the country is blessed with many natural resources that are capable of supplying the whole nation's food needs, the stable supply of food remains difficult due to inappropriate farming techniques and poor functioning of the marketing system as a whole.
- 1.3 Since the New Economic Mechanism (NEM) was introduced in 1986, Lao PDR has been in transition from a centrally planned economy to a market oriented economy. The agriculture sector has not been an exception to the policy of market economy, however, it has shown slow growth so far. GOL launched a development policy stressing three programs in the Fourth Socio-economic Development Plan (1996-2000) comprising of: stable food production; promotion of commercial agricultural and livestock products; and mitigation of shifting cultivation. MAF set up its basic development policy with the above-mentioned issues in the "Vision for Agricultural and Forestry Development to the Year 2020" ("Vision 2020"). In addition, MAF formulated in 1999 "The Government's Strategic Vision for the Agricultural Sector" ("Strategic Vision") defining a development strategy toward the year 2020. These visions and strategies provide the direction and a framework for agricultural development in Lao PDR, however, indicate neither specific development plans or implementation programs for them to be realized. Thus, the plans for related activities to achieve these visions, through the strategies, are urgently needed.

- 1.4 Considering the above background and based on the results of the JICA project formulation study made in March 1999, the GOL requested the Government of Japan (GOJ), in November 1999, to extend technical assistance for a Master Plan Study on Integrated Agricultural Development. In response to this request, an Agreed Minutes of Meeting for the Scope of Work for the Study made between JICA and the MAF of the GOL, dated June 30, 2000. The objectives of the Study are to:
- (1) formulate an Action Plan (A/P) and its implementation program that contribute to more effective promotion of the agricultural development, based on the framework of Strategic Vision as the development strategy for the agriculture sector of Lao PDR, and of Vision 2020 recognized as the basic development policy;
 - (2) identify priority programs and projects to be assisted by donor agencies including GOJ, through examining A/P and formulating further additional studies and implementation programs with envisaging executing agencies responsible for the implementation; and
 - (3) transfer technology to counterpart personnel on investigation method, planning procedure and formulation approach for respective relevant fields.

Study Procedure and Work Progress

- 1.5 The Study, covering the whole Lao PDR, has been carried out in two phases over two consecutive fiscal years. In Phase I, the A/P until the year 2020 is formulated in general terms within the framework of the Vision for 2020 and the Strategic Vision for the Agricultural Sector. The Study examined development programs implemented by the GOL with and without donor assistance, the process and performance of administrative decentralization, the policy for transition to a market economy, the present status of rural development, the agriculture and farming conditions including shifting cultivation, the rural infrastructural conditions, the environmental aspects and the social and cultural aspects etc.
- 1.6 The A/P is formulated based on an examination of the above programs/policies and from comments made in the first workshop with representatives from the relevant internal and external agencies. In Phase II, necessary supplementary data and information have been collected based on the A/P formulated in Phase I. Following this implementation programs for selected initiatives and projects are formulated to the year 2010. These could be supported by donor agencies including GOJ. The results are presented in the Draft Final Report and to a second

Workshop. The Final Report is prepared based on recommendations and results of the Second Workshop.

2. National Development Goals and Recent Economic Performance.

- 2.1 The central planning and control that existed from 1976 to 1985 markedly influenced the environment for economic growth until then. In 1986, GOL made a drastic policy change in moving to a market oriented economic system by introducing the New Economic Mechanism (NEM). This was associated with reforms in structural formation and macro-economic management that created the basic foundations for an incentive driven economy. The progress of reform program was reflected in a growth of real GDP of ranging from 6.3% to 8.1% per annum over the period 1990-96. In 1997 Lao PDR joined the Association of South East Asian Nations (ASEAN) and the ASEAN Free Trade Area (AFTA) regional trade block.
- 2.2 In the latter half of 1997, and soon after the 6th Roundtable Meeting (RTM) the Asian financial crisis began to show its effects on the Lao economy. The economy was disrupted by a sudden and drastic decline in GOL revenues and foreign exchange inflows. The national currency, the Kip, depreciated sharply and inflation reached three digit figures. Although there was a sharp decline in the rate of economic growth, real growth was maintained at reasonable levels due in large part to the favorable performance of the agricultural sector. However, the pre-crisis socio-economic targets as outlined at the 6th Roundtable could not be achieved. Foreign direct investment (FDI) also showed signs of sluggishness in these years, especially in 1997 in terms of foreign investment inflows.
- 2.3 The effects of the crisis were marked and real growth in 1998 declined to 4.0% in contrast to an average of 7.0% in the two previous years. However, the decline in real growth rates was not as marked as in neighboring countries. Paddy production increased sharply between 1996 and 1998. Overall, growth of the economy recovered in 1999, inflationary pressures were brought under control and were sharply reduced and the trade balance improved. At the 7th Round Table Meeting at the end of 2000, GOL prospects that output from the substantial investments made in hydropower would come on-stream towards the end of the first decade.
- 2.4 The GOL's development agenda comprises three major objectives: poverty reduction; infrastructure development and human resources development. GOL's overarching goal is to liberate the country from the group of least developed

countries by 2020 through sustainable and equitable development. This national development challenge is seen in the context of widespread poverty, weak fundamentals of the economy and lack of capacity. GOL has adopted a two-pronged approach; growth with equity as ‘internal challenges’, and active participation in the region and gradually in the world economy as ‘external challenges’. The internal challenge is aimed at poverty reduction with improvement in the standard of living in the context of equitable development. Lack of capacity at every level has been the major stumbling block. The emphasis is on capacity and institution building along with human resource development. The internal challenge also lays emphasis on equity issues and has as a core policy objective, the reduction of income disparities between urban and rural areas. The external challenges are addressed to promotion of trade and to access to the large ASEAN market. As a member of AFTA, Lao PDR is a party to the agreement on Common Effective Preferential Tariff (CEPT) that commenced in 1999 with a termination date of 2008. An additional challenge is to improve the external balance situation in general and the trade balance in particular. A particular challenge is to ensure Lao’s economic integration would enable her to compete and thereby benefit through increased exports and cheaper sources of supply for her major imports.

- 2.5 The Lao PDR Socio-Economic Development Strategy for 2020, 2010 and 2001-2005 outlines the main national objectives as poverty reduction, economic growth at the most appropriate rate and improving the standard of living of the population. To reach these objectives, the target for the five year plan (2001-2005) are: 7-7.5% annual GDP growth; 4-5% annual growth for agriculture; 10-11% annual growth for industry; and 8-9% annual growth for the service sector.

3. Agriculture in a Macroeconomic Setting

- 3.1 Agriculture is the main economic activity in Lao PDR and covers a wide range of activities from subsistence farming to agriculture related industries. In 1999, agriculture accounted for 53% of GDP. Rice farming is by far the single most important national economic activity accounting for 20% of national GDP and 39% of agricultural GDP. Livestock as part of the family farm is also important. About 83% of the population resides in the rural areas and 66% of these rely on subsistence agriculture. Besides paddy, the family obtains basic food from livestock rearing and from gathering forest products. Approximately 620,000 farm families are dependent on agriculture of which 492,000 are reliant on subsistence agriculture. So the link between agriculture and the rural area is very close. But

rural areas are seriously handicapped by the lack of basic facilities such as access to markets, schools and health facilities.

- 3.2 Agriculture would continue to be of significant importance to the Lao economy for many years to come although its relative share in GDP is likely to gradually decline from the present relatively high level. Agricultural productivity has suffered from a long period of under investment. Access to improved farming methods and post harvest technologies have been limited and only recently have investments by government and donors in irrigation enabled any extensive dry season cultivation. There are also sharp differences in resource endowment and growth in the agricultural sector. The central and southern regions along the Mekong River and its major tributaries are irrigable, have fertile soils and relatively stable monsoon climate. In most years, these areas produce a surplus. In contrast the mountainous and rugged northern areas as limited irrigable land, poor soils and moist to subtropical climate and it experiences chronic rice deficiencies and is supplied by China and Thailand. These geographical differences lead to different farming systems and given the overall development objectives of improving rice cultivation as well as commercial crops, livestock and fisheries. The Action Plan takes account of these differences and caters to the varied regional needs.
- 3.3 At the same time, agricultural development is very closely interwoven with rural development and it is not possible to pursue a goal of agricultural development without some basic prerequisites for rural development. Many obstacles stand in the way of developing and expanding agricultural exports such as the poor market access and the absence of established distribution networks. A rural development action plan should therefore need to synchronize with the agricultural development plan with a program for removal of constraints such as the lack of infrastructure, limited human resource capacity, poor agricultural support and delivery services, easy access to inputs and markets and the lack of medium and short term credit.

4. Agriculture in Lao PDR

Natural Resources and the Environment

- 4.1 Water resources in Lao PDR is vital not only to Laos PDR but also for the whole Mekong region. The total annual river runoff in Lao PDR is estimated at 229,000 MCM of which about 93% flows into the Mekong River. The area under forests has been declining over the past 20 years with a loss of about 1 million ha or 8%

since 1982. The areas under permanent agriculture and shifting/rotational agriculture in 2000 are roughly assessed as 1,130,000 ha and 680,000 ha, respectively. Most forests and potential (degraded/recovering) forest areas are important grazing lands for livestock, especially after farm residues have been exhausted. They also provide food and other NTFPs to farm households. The natural forests play an important part in the economic life and livelihood of farm household. It is estimated that more than half of farm food and income is gathered from the forests.

4.2 Lao PDR is still rich in high forests of various types. These forests occupy an estimated 10.7 million ha or 45% of the land area. In addition, there are just under 10 million ha of potential forest including degraded forests, bamboo areas, etc. It is one of the few areas in SE Asia where there are large blocks of forests intact. GOL has created and is maintaining 20 National Biodiversity Conservation Areas (NBCAs) covering 3.3 million ha.

4.3 Lao PDR has established the Environmental Protection Law (EPL) followed by an Environmental Action Plan and Environmental Impact Regulations. The EPL lays down the principles, rules and measures for managing, monitoring, restoring and protecting the environment in order to protect natural resources and bio-diversity and to ensure sustainable socio-economic development. The Environmental Action Plan lays down the legal and institutional framework for environmental management and the Environmental Impact regulations cover general guidelines and procedures for Environmental Impact Assessment (EIA).

Institutions and Organizations

4.4 The Ministry of Agriculture and Fisheries (MAF) is the primary agency responsible for agriculture, livestock, forestry and fisheries. MAF is responsible for strategies and plans for agricultural production, laws and regulations and for technical and scientific agricultural research. In addition, there are several other agriculture related agencies; the State Planning Committee (SPC), the Committee for Planning and Cooperation (CPC), the Ministry of Finance (MOF), the Ministry of Commerce and Tourism (MCT), the Ministry of Industry and Handicrafts (MIH). The Lao Women's Union (LWU) is a mass organization operates development projects at the field level mainly concentrating on women's activities and micro financing.

4.5 At the local level, the provinces are the major implementers of development activities with the Provincial Governors at the head. Departments and units of the

line ministries provide assistance to the Governors. The provincial Agriculture and Forestry Services (PAFS) is responsible for the planning and execution of activities in the provinces. The director of PAFS is responsible to the Minister for Agriculture and Forestry and the Governor of the Province. The main activities of the District Agriculture and Forestry Office (DAFO) are crop monitoring, vaccination, meat inspection, statistic collection, irrigation construction. In the forestry sub-sector, officers are responsible for inspection of wood processing facilities, monitoring forest products and forest supervision and guarding. The Village Administrative Authorities pass on instructions to farmers relating to projects in agriculture and forestry. The village administration has tax collection functions. With the decentralization underway, village administration budgeting and planning procedures allows villages to make their own plans and budgets under the supervision of the district authorities. Village authorities also have a statistical function that of reporting statistics weekly, monthly and quarterly to the district authorities.

- 4.6 The decentralization process commenced with the Prime Minister's Decree of 2000 has progressed rapidly in that the local governments have been given control over a greater portion of the Public Investment Program (PIP). The provinces received only 30% in 1998 but this has now increased to 70% for the 2001/2002 fiscal year. However, the capacity of the local government office to manage the budgetary resources at the local government level is very limited.

Land Tenure

- 4.7 All land in Lao PDR belongs to the State but since the late 1980's the Government has taken legal steps to broaden the access to land use rights and individuals are guaranteed its use. Under the Forest law (1996) and the Land law (1999), land use rights can be inherited, transferred, or leased and are legally recognized by the State provided the transaction is recorded and land tax paid. In order to establish sustainable land use, legal land use rights are allocated to individuals through a land allocation process since early 1994. The Government assigns land management responsibilities including land allocation to relevant ministries such as MAF and the District Administrative Authority. These agencies are responsible for the issuance of Temporary Land Use Certificates (TLUC). TLUC attests the provisional use right of agricultural or forest land for a period of three years. At the end of three years, if the land had been used as originally specified, the individual may request a Land Title which is the main evidence for permanent land use rights.

- 4.8 Agricultural land is taxed with rates ranging from 3,000 Kip/ha in cleared grassland to 20,000 kip/ha on the fallow rice fields in lowland areas. While the land allocation process is proceeding slowly, cultivated areas are under reported since farmers avoid tax payments. Efficient land markets and security of land tenure are important elements for long-term productivity and sustainability of the land resource base. A start has now been made with a pilot project on land titling and establishment of land registers at the provincial level with a view to eventually setting up a nationwide land registration system.
- 4.9 Resettlement is observed across all ethnic groups in Lao PDR. Under the stabilization of shifting cultivation programs, the aim of resettlement is to protect the forest and the natural resource base by providing sedentary settlement and new villages for individuals practicing slash and burn. Since 1994, the Government has also pursued the Focal Site approach for rural development. In development of the focal sites some villagers are displaced and are provided with alternative land. In most cases of voluntary resettlement, the availability of paddy land has been the major incentive for moving. There is currently no legal policy regarding resettlement and there is a need for the establishment of a legal framework and the formulation of government guidelines for resettlement especially involuntary resettlement.

Human Resource Development

- 4.10 The human resources program of MAF is to focus on training to have a cadre of qualified technicians and specialists to assist farmers in farming. The strategy is to have district farming systems generalists at the grassroots level to provide adaptive research based extension services and on-the-job training to farmers and shifting cultivators on sustainable adaptive technology. The literacy level of the country as a whole is low at 60% and there is a need to upgrade the literacy level of the population in general and the farming community in particular, if agricultural technology and improved farming practices are to be disseminated among farmers.
- 4.11 A major constraint to agricultural development in Lao is that the staffing of MAF and its line agencies at province and district level is characterized by low education and skill levels, particularly at the local level. There is also an uneven distribution in terms of numbers and education level at MAF. Districts in the mountainous areas are the least staffed and have the least educated officers. There appears to be reluctance on the part of staff to move to remote areas. Many of the districts have less than ten staff for all agriculture and forestry including
-

administrative and accounting personnel. A supply-demand analysis of MAF personnel undertaken in 1996, with emphasis on the distribution of Farming Systems Extension Worker (FSEW) and Subject Matter Specialists (SMS), revealed that there was a district deficit of 713 staff and a provincial surplus of 227 staff (SMS). The situation in 2001 shows no change. In addition, donor assistance training programs have benefited staff at the Ministry level rather than at the provincial or district level.

- 4.12 The existing training institutions, numbering twenty-nine are under NAFRI responsibility. However, due to the lack of an integrated extension and training system, these facilities are not fully utilized. The three regional Agriculture and Forestry Technician Schools (AFTS) are expected to provide trained and qualified extension workers. However, the curricula of the three AFTS are not geared to training for extension work with an over emphasis on theoretical work. The schools also lack qualified teachers, textbooks, laboratories and land areas for fieldwork. The schools are also beset with budgetary problems and have insufficient facilities.

Field Crops

- 4.13 Lao PDR is classified agro-climatically into six agro-ecological zones (AEZ). Most soils in Lao PDR are acidic and poor in minerals and organic matter. The total area of holdings for agriculture use is about 1.0 million ha including fallow according to MAF statistics. However, there appears to be a discrepancy when this data is compared to satellite imagery that estimates the area of agricultural land, excluding grassland as 1.8 million ha. Rice is the dominant crop and occupies 68% of the total cultivated area. Other annual crops and permanent crops account for only 9% and 8% respectively highlighting the predominant role of paddy and of subsistence farming in the Lao PDR agricultural economy.
- 4.14 Lao PDR 's major farming systems are identified as (i) lowland rainfed; (ii) lowland irrigated; (iii) upland and mountain; and (iv) plateau. In the plains, all the cultivated land is for lowland rice production in the wet season and for livestock grazing in the dry season. The upland and mountain farming systems are dominated by single wet season crop production and paddy is the most important crop mainly in shifting cultivation. In the plateau farming system, commercial cropping is practiced and there is a declining trend of shifting cultivation. The major commercial crops are coffee, tea, cardamom, fruits and vegetables.

- 4.15 The annual production of rice is around 1.8 million tons on an average from 1996 to 2000. Production has registered a strong increase in the last four years mainly through increased yields and also through double cropping. Production of upland rice is showing a decline due to a decline in shifting cultivation. The annual production of vegetables has increased rapidly in recent years followed by sugar cane, coffee, maize, and peanuts mainly due to an expansion in acreage and increase in yields. Cropping practices are traditional with most farm households growing local crop varieties and using traditional farm practices with low yields. Most farmers retain seed from the previous harvest and only 30% of farmers use improved seed. The annual supply of improved paddy seed through the public seed multiplication system is about 500 tons that is sufficient for about 32,500 ha or about 7% of the lowland rainfed paddy. For other crops, the supply of improved seed is limited, with the exception of imported vegetable seed. Farming practices are mainly with farm labor and draught animals and the use of chemical fertilizers and agro-chemicals is rather limited.
- 4.16 National Agriculture and Forestry Research Institute (NAFRI) is responsible for all research on agriculture forestry, meteorology and hydrology. Its main focus to date has been rice and forest research through donor assistance. The research work on commercial crops, livestock and fisheries is very limited. NAFRI has a staff of 356. There is a critical need for NAFRI to upgrade the skills of research staff and extend its research activities to all areas. The Agricultural Extension Agency (AEA) was established in 2000 and is responsible for farming systems extension. The AEA would support the SMS at the provincial level and the FSEW at the district level. The AEA is not equipped to undertake extension work in forestry, livestock and fisheries due to lack of trained staff. The present extension staff needs to be re-trained in participatory planning, group training and on-farm demonstration as they are currently engaged mainly in administrative duties. Operational funds and equipment are also in short supply. National Agriculture and Forestry Extension Services (NAFES) has been established in August 2001 as a new extension organization that could cover all the sub-sectors of agriculture in place of AEA.
- 4.17 The major constraints to crop production appear to be the lack of improved seed and plant material, lack of knowledge of improved technology, lack of access to credit, limited market outlets and poor post harvest facilities. However, the crops identified as having potential for export and/or import substitution based on comparative advantage analysis are as follows:

Field Crops	:	maize, peanut, soybean, sesame, sunflower, sorghum and safflower
Fruit	:	grape, mandarin, sapodilla, orange, durian, rambutan, cashew, logan and tamarind
Industrial Crops	:	coffee, sugar cane, cotton , and sericulture.

Livestock and Fisheries

- 4.18 The livestock sector plays an important role in the livelihood of farmers. It generates almost half of an average farmers income and is a source of wealth and saving. The majority of livestock is part of the integrated family farm system. There is considerable potential to increase livestock production and value added products for export. But a program for expansion of livestock production also needs an integrated and coordinated program of improved animal health, animal nutrition and livestock breeding. Farmers currently face big losses through disease. The livestock development plan of MAF aims for increase in production by 300% by 2020. Though livestock has shown steady and increased production increases annually, there are many constraints to further development. These relate to lack of knowledge of epidemic disease, lack of feed in dry season, poor breed, poor support services in marketing and market information systems, livestock extension and artificial insemination services. Despite these constraints Lao PDR has a comparative advantage in neighboring export markets that signifies that exploiting this potential would require an improved grading and classification system, better market information, better animal disease control and epidemiological services and improved quarantine systems.
- 4.19 Fish is a major source of protein for the Lao Population accounting for around 40% of total protein intake. Fish farming is classified into: (i) extensive farming with low density without feeding; (ii) semi-extensive farming with small amount of feeding; and (iii) intensive fish farming with high fish density with feeding. The majority of fish belongs to category (i) or (ii). The Government has been assisting fish farming through the operation of fish stations with hatcheries. However, mortality rates are very high and a consistent technology and standard of breeding is lacking. This is particularly true of the hatchery stage to the distribution of fingerling to producers. The government plans for expansion are very ambitious as they target for an 3.6 fold increase in production from current levels by 2020. Although there is a lack of technical capacity within MAF to establish fish culture promotion programs, Lao PDR has a comparative advantage for development and export of fish.

Shifting Cultivation

- 4.20 Shifting cultivation, a traditional upland cropping system is carried on in three forms: (i) traditional swidden rotational system; (ii) pioneering exploitative system; and (iii) transitional shortening rotational system. The major shifting cultivation areas are in the northern provinces and in the eastern parts of the southern provinces. The area under shifting cultivation is estimated at 680,000 ha. and the total area used for all forms of shifting cultivation is about 3.2 million ha or 13% of the land area. The number of families practicing shifting cultivation in 2000 was estimated at 340,000 or a population of 2.06 million (39% of total population).
- 4.21 A number of past and on-going programs have been designed and implemented to facilitate the stabilization of shifting cultivation through the development of sustainable land use systems incorporating conservation and agroforestry systems. The goal has been to transform from shifting to sedentary farming and livelihood systems program interventions have covered land allocation, introduction of improved agro-forestry land use systems, non-timber forest products (NTFPs) management systems, and cottage industry development. Agroforestry techniques have been employed in Laos throughout these programs. In addition, a diverse range of NTFPs, including paper mulberry, cardamom, styrax resin, rattan and bamboo are gathered and utilized for a variety of family needs and also for sale, including exports. Trees and forests are also important components of the farming systems and are essential for the livelihoods in shifting cultivation areas. It is also a program with potential for income generation for farm families.

Marketing and Agro-Processing

- 4.22 The marketing system is mainly undeveloped and still follows traditional lines largely due to the large subsistence component in farming. The farmer brings any surplus produce to local market while the medium to large-scale farmer sells to middlemen who visit villages during harvest. Interregional distribution is limited except for some fruit and fish. Regional market prices vary significantly and is a reflection of the poor market information, lack of transportation facilities, poor access roads and inter regional taxes. The marketing system is one area where there is little progress towards liberalization and the move to a market economy. The State Foodstuff Company (SFC) still has a commanding share of the market for paddy with storage facilities and rice mills. The private trader/middleman competes with SFC.

- 4.23 Live cattle, buffalo, pigs are collected from farmers by the SFC or middlemen and sent to slaughter houses who in turn sell the meat to restaurants, retail markets, hotels, hospitals etc. They are exported to Thailand although the unofficial trade is much larger. There are currently 444 retail markets in Lao PDR. Of these 110 are managed by GOL, 73 by Provincial and District Administrations and the rest by villages. Cool rooms and refrigerated facilities for perishable produce have yet not been introduced although some ice is used in the case of fish in large markets.
- 4.24 There is no established market information service in Lao PDR nor is there any information provided in TV or radio programs or the news media. The sole market information source is the trader and SFC. With a steady growth in vegetable and fruit production, the opening up of markets, more traders and middleman entering the market for vegetables and fruits, there is a need for improvements in the marketing system. The system of markets in major towns is non-existent and most trade is done in unhygienic conditions in an open space often with improper drainage. There are needs for improved market access in the rural areas, improved trade fairs, establishment of wholesale markets and removal of regulations and barriers to free competitive market competition.

Rural Finance

- 4.25 The primary source of credit to rural households is family, friends and lending households. Informal institutions account for only 15% of lending with interest rates ranging from 42-73% per annum. These institutions also cover village revolving funds (VRFs) and rotating fund groups. VRFs are local financial institutions and VRF loans cover about 15% of all Lao PDR villages and have grown rapidly in the last ten years. There are about 1640 VRFs throughout Lao PDR. VRFs are generally financed by donors or NGOs and include over 1000 rice banks. Although they have assisted in community development, they do not have a continued existence and are normally confined to the life of the project. Deterioration of their financial position result from asset depletion, in part because interest rates are below inflation rate and do not cover all costs and because of a large number of loan defaults. Despite these shortcomings there are a number of promising VRFs that are able to reach small borrowers because of their rural location, local ownership and familiarity with village residents.
- 4.26 The formal financial system consists of the Bank of Lao (BOL); three state owned commercial banks (SOCBs), one specialized government owned Agricultural Promotion Bank (APB); two joint venture banks ; and branches of several foreign banks. Institutional credit in Lao PDR has a relatively recent history and is in its

early development stage. The SOCBs are in a weak financial position with limited expertise and staff. APB is a specialized government owned bank set up in 1993, and is reported to serve 15% of all villages (about 3000) containing 14% of all the households. APB commenced lending in 1994 using group loan methodology with group guarantee as collateral. The depository base of the bank is quite low and most of its resources are provided annually by BOL and to a smaller extent by donor credit lines. APB currently provides long term and medium term loans at 7% and 8%, respectively, and short-term loans at 8% that are well below market rates for these loans at around 16-20%. Subsidized interest rates make loans from other banks unattractive to agricultural borrowers and have a destructive long-term effect on both rural financial and agricultural sectors. Currently a diagnostic study is underway of APB operations and recommendations for the improvement of all aspects of APB operations are expected by end 2001. At the same time donor technical assistance is being provided to make recommendations for improving the operational performance of SOCBs. Alongside these initiatives, there is a small micro finance project being implemented in three provinces. The project aims to set up formal sources of micro finance and supports training of staff of participating micro finance service providers and also provides capital grants for new micro finance institutions.

Rural Development

- 4.27 Since 1994 GOL has been implementing the Rural Development Program on a focal site approach basis, with a definition of the focal site as “centers of change and learning” for the rural development. The ultimate goal of rural development is poverty alleviation in remote and isolated areas, adopting bottom-up participatory planning and implementation. In 1994, the Central Leading Committee for Rural Development (CLCRD) was established under the Prime Minister’s Office, and each province formed Provincial Leading Committee for Rural Development (PLCRD) that coordinates the work of the line ministries. The focal sites were selected from the lists submitted by Provinces based on criteria: (i) urgency for poverty alleviation; (ii) potential areas justifying investments in view of creation of development poles; and (iii) risk areas with opium plantation, UXO, and flood hazards.
- 4.28 The 1996-2000 Rural Development Program planned to establish 87 focal sites with an expected investment of Kip 154 billion (Kip 30.8 billion per year on average). However, actual expenditure was quite small. Due mainly to this funding shortage, the focal sites were insufficiently developed and only 59 focal sites, involving 948 villages and 321,800 people, are now operational as of

February 2001. Major works for the focal site establishment were rural infrastructure development/improvement, including irrigation facility, school building, health facility, feeder road, water supply facility, etc. Beside the 59 focal sites, similar rural development activities are being carried out directly by the provincial governments using their own funds or allocated funds from the central government. Foreign assistance including NGOs is offered considerably in this type of rural development activities, however, those actual progress is unknown. The on-going rural development through the focal site approach is a worthy effort of Lao PDR, however, several issues are identified through the past more than five-year operation, such as that: (i) selection of focal sites is biased heavily toward poverty and politics; (ii) responsibilities of PLCRD are unclear; (iii) monitoring and evaluation of rural development have not been developed yet; and (iv) staff capacity in provincial executing agencies are insufficient.

- 4.29 Given the large isolated and remote areas of the country and the lack of access to social amenities of many rural communities, rural roads are an important component of governments development programs. Hence, high priority is accorded to this component. The rural roads are in poor condition and most of these are impassable in the rainy season. Rural water supply is another important element of rural well-being. Significant progress was made in the 1990's and about 62% of rural areas can now get safe drinking water. Electricity is also needed and at present only 10 % of rural areas is provided with access to the main power grid.

Irrigation

- 4.30 The irrigation service area is about 295,000 ha in wet season and 197,000 ha in dry season. Irrigation development has been concentrated in three areas; the northern mountainous area, the Vientiane Plain where much work has been undertaken and the major plain along the Mekong River. Dry season cropping benefited immensely since 1996 with the implementation of the National Pump Installation and Management Project.
- 4.31 Irrigation Management Transfer (IMT) program is now a key policy of government in the irrigation sector following the conclusion of two projects supported by ADB and the Netherlands Government in the 1990's (SIRAP and SRIDP). IMT is to transfer ownership of irrigation schemes so that all responsibility for O&M activities are taken over by the beneficiary farmers. An important issue in IMT is cost recovery and the Water User's Association takes over the responsibility for O&M and the collection of water fees from users. Fees

collected are for repayment of investment costs to government and irrigation service fee for the O&M of the irrigation system.

5. Assessment of Agricultural Resource Base and Potential.

Assessment of Agricultural Setting

- 5.1 The agricultural setting was assessed with the objective of identifying the present condition of agriculture in Lao PDR by classifying the 141 districts into several groups based on agro- and socio-economic conditions in each district. This assessment is made by Principal Component (PC) analysis based on two sets of census data, i.e. Agriculture Census 1998/99 and Population Census 1995, and GIS data. The PC analysis has suggested that five sets of PC indicating the present setting of agriculture in Lao PDR were discovered through a scree test. Each PC was then interpreted as PC-1: Transitional Farming; PC-2: Market Orientation; PC- 3: Water Resource Utilization; PC-4: Farm Intensity; and PC-5: Degree of Diversification, respectively. All the 141 districts are classified into 10 groups according to the five PC scores of each district through cluster analysis.

Assessment of Agriculture Potential

- 5.2 The objective of agriculture potential assessment is to identify the agriculture potential in Lao PDR in terms of lowland rice, upland crops, tree crops and grazing land at the preliminary level. The assessment has been carried out using existing digital data, namely; forest cover and land use, soil, climatic condition, topographic condition, and unexplored ordnance (UXO). The identification criteria for potential area of each crop group is also established based on previous studies with an assistance of NAFRI. The assessment has revealed that the total potential area for annual and perennial crops was around 3.1 million ha comparing to 1.0 million ha of existing agriculture land as given in the Lao Agriculture Statistics, 1975-2000. It is therefore judged that the further expansion of 2.1 million ha may be possible in terms of annual and perennial crop cultivation.

6. Agricultural Policy and Development Strategy

National Long Term Development Goal

- 6.1 The overarching objective of the Government of Lao PDR across all development sectors is to graduate from the group of least developed countries (LLDC) by the year 2020. The key determinant is the attainment of a GDP per capita of US \$ 885 in 2000 constant prices by the year 2020 as defined by DAC. The agriculture sector, accounting for about 53% of GDP, would continue to play an important role in the economic development of Lao PDR although its relative share would

decline due to relatively faster growth of the other sectors. The development performance of agriculture is the key to the achievement of the national development objectives. Government has three clear development objectives for agriculture to 2020: (i) ensure food security and self-sufficiency in food; (ii) promote commodity production, especially for export; and (iii) stabilize shifting cultivation. These objectives are elaborated in the Government's Strategic Vision for the Agriculture Sector. The Strategic Vision presents two distinct development initiatives; one for flat lands along the Mekong Corridor and the other for the sloping lands.

Demographic and Macro-economic Frameworks

- 6.2 The National Statistics Office has three scenarios of population projections to 2020. Of three scenarios, Scenario-3 assumes decline in population rate of growth from present 2.6% to 2.35 by 2010 and 2.05% by 2020 resulting in population of 8.205 million in 2020. This is the most likely outcome. It is projected that the rural sector would still account for 80 % of the population in 2020. An attempt is made to estimate the rate of growth required to reach a target per capita income of US\$ 885 in 2020 with an assumption of population of 8.205 million in 2020. This scenario shows that the economy would need to grow at 8.9% to 2020, which is a very high rate of growth, and almost double the rate of growth of the past five years. This also implies that the agriculture sector would have to grow at a faster rate than the national average of 8.9% unless there is spectacular growth in the other two sectors.

Resource Availability for Action Plan Implementation

- 6.3 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 on the assumption that growth rates in GDP are in line with the achievement of the target of \$885 per capita by 2020. The PIP for 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.

7. Concept and Approach to Action Plan

Market Economy

- 7.1 The conceptual framework underlying the Action Plan is in line with government policy since 1988 of moving to a market economy. The market economy means that market signals become significantly more important in guiding investment,

production and consumption decisions. The market economy means that government provides an enabling environment for the private sector and progressively removes all regulation and control so as to permit the free play of market forces in the production and consumption of goods and services. The government plays a facilitating role while producers (farmers), agro-processors, marketers and consumers make the production, investment and consumption decisions. In addition, the government regulates the market in situations where it is in the interest of the public to do so.

- 7.2 In a market economy, there are some situations where the market does not function effectively due to ‘market failure‘ or externalities. In such situations, government should intervene with appropriate policy instruments to assist the producer or consumer. In cases where an individual farmer is reluctant to adopt new technology or farming practices, government should intervene to ensure wide acceptance of the new techniques. A market economy also does not function when private competitive markets tend to undersupply and do not provide adequately as in the case of remote areas where private traders may not sell agricultural inputs in sufficient quantity or in a timely manner due to lack of profit incentive or size of local market. This is often due to uneconomic size of inputs required by village or the high cost of transport. There are also cases such as in animal health or conservation when the actions of one farmer in not undertaking preventive measures can have a detrimental effect on other farmers making a case for government intervention in the market.
- 7.3 In a market economy, control of prices and subsidies on all inputs or outputs is gradually eliminated as controlled or regulated prices give wrong signals to producers and consumers leading to over-production or under production. The private sector is to provide for all farm input services as well as produce, market, process all farm output as well as other agricultural services. Post harvest activity and all agro-processing is a private sector activity. On the trade front, it means a move towards free trade within and outside national boundaries. AFTA accession and recent government initiatives in tariff reduction are positive actions.
- 7.4 In general, careful consideration was given to all these factors in formulating the projects/programs for the Action Plan. Particular emphasis was placed on facilitation. Programs were also included to ensure sufficient regulation such as meat inspection, market information and grading and classification systems. Also, much emphasis was placed on rural infrastructure and on agricultural support services. The Action Plan also takes account of the demand for programs for new

cultivation techniques, such as improved seed or fish fingerlings and also provides for market failures and externalities such as in programs to stabilize shifting cultivation, agro forestry programs and watershed management.

Policy Framework

- 7.5 Much progress has been made since 1986 in moving from a command to a market economy. However, the enabling environment for agricultural development is in need of further reform and the policy framework needs to be further modified to enhance the incentive structure to enable the move out of subsistence to a market oriented economy. There are many critical areas such as: public sector interventions in input and output markets; unclear land policies; presence of government owned monopolies; market distortions in heavily subsidized rural credit; costly policy on rice self sufficiency; and tenure policies constraining private investment in the rural sector; and poor coordination of donor assistance projects both in formulation and implementation.

Approach to Action Plan

- 7.6 Within this overall market orientation conceptual framework, some basic approaches and guidelines were followed in the formulation stage as well as in the sequencing and prioritization of programs, as elaborated below:

- (1) Phasing of Investment in selection of programs requires consideration of human resource base, availability of skilled staff, timing and type of donor assistance, timing of returns of project investments, duration of the gestation period, complementarity of related programs and the resource availability.
- (2) Policy Framework should provide an enabling environment for development so that agriculture could grow under a market driven environment.
- (3) PIP Capital Expenditure Imbalance should be redressed to secure adequate operation and maintenance funds.
- (4) Sub-sector Budgetary Allocation Pattern is needed to be examined and possible redressed in the Action Plan.
- (5) High Return - Quick Yielding Activities such as supply of fingerlings to farmers or improved paddy seed should be given a priority.
- (6) Project Implementation Capacity under the decentralization policy at the provincial and district level should be carefully scrutinized for each project.
- (7) Center Provincial Revenue Sharing Activities should be reviewed to assess the degree to which the local authorities could meet counterpart fund payments especially for donor-funded projects at the local level.
- (8) Organizational and Administrative Capacity of MAF should be strengthened for sound implementation of projects and programs, in particular with adequate aid coordination.
- (9) Extension Services should be taken up with a high priority, because it provides a high return on investment to the national economy as is evidenced by studies in Asian countries.
- (10) Improvement of Infrastructure Facilities, particularly the rural road network, is a high priority, since studies in Asian countries indicate a very high return to the economy.

- (11) Emphasis on Irrigation Management is given to improve the efficiency of the irrigation system per unit of production through rehabilitation of existing schemes and formation and training of farmer organizations, provided that the need for new irrigation works could be reviewed after 2005.
- (12) Rural Finance and Credit is in need to strengthen the APB and the SOCBs to give them a more commercial orientation.
- (13) Commercial Crops are encouraged in the context of the GOL's strategy to move towards diversification supported with a vigorous research and promotion program.
- (14) Trade Liberalization needs continuous reviews that 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 (CEPT) Inclusion List.
- (15) Food Security and Rice Output have to be sustained by increased unit yield of paddy through distribution of improved seed, improvement of cultivation technologies and effective use of existing irrigation systems.
- (16) Poverty alleviation is expected to be comprehensively and sustainably achieved by implementing the proposed Action Plan in conjunction with activities in other related economic and social development sectors.

Area Based Agricultural and Rural Development

7.7 An indicative direction of agricultural and rural development is examined by dividing the country into four regions on the basis of assessment of agricultural resource base and potential. The result is summarized in the following table.

Region	Sub-region	Indicative Development Direction
1. Northern Upland and Highland Areas	Overall Area	Stabilization of shifting cultivation, Development of alternative production systems, Rural road networks, Improvement of farming economy, and Rural development focussing on densely populated areas
	Lowland Paddy Area	Distribution of improved rice seeds, Improvement of cultivation techniques, Rehabilitation and improvement of existing irrigation systems, Fish culture
	Sparsely Populated Remote Areas	Focal site approach rural development
	Borderland areas	Commercial crop production for export, Private sector investment in agro-processing
2. Vientiane Plain		Vegetable production, Increase of paddy productivity, Flood mitigation
3. Central and Southern Areas	Central and Southern Mekong Corridor	Increase of paddy productivity, Crop diversification, Promotion of market oriented agriculture, Flood mitigation
	Central and Southern Upland and Highland Areas	Same development direction as Northern Upland and Highland Areas, however less potential to expand agricultural land
4. Boloven Plateau		Upgrading quality of present commodity crops, Crop diversification, Small scale irrigation development

8. Sub-Sector Based Agricultural Development

Land and Water Resource Management

- 8.1 Both the land and water resources are of national importance, particularly for lowland agriculture and fishing. Considerable pressure is being placed on these resources due to expanding population. The objective in the Action Plan for this sub-sector is the sustainable development in an environmentally friendly way through proper management of both renewable and non-renewable resources. The major areas for consideration in formulating a strategy is to emphasize appropriate land use, paying attention to land capability, watershed and river bank protection and appropriate use of arable and pasture/forest land in all land zones.
- 8.2 Land registration is a priority as it is the basis for farmers to practice sustainable cultivation and is particularly important in stabilization of shifting cultivation. Land titling is necessary in all farming areas to provide a measure of security and ownership so that farmers could undertake capital improvements on the land and also invest in agricultural inputs in cultivation. Agro-zoning and land use planning is a priority as potential agricultural areas could be identified and is an useful tool in planning further programs and water and land development schemes. Watershed management is also necessary as a program priority as excessive erosion could have a detrimental effect on dams through silting, especially on small dams that provide the means for livelihood for many farmers.

Institutions and Organizations

- 8.3 MAF is the major actor in the proposed Action Plan with an increasingly important role for PAFS and DAFO. The objective is to strengthen these organizations and reorient their activities with the major emphasis on assisting farmers through provision of support services, especially extension and advise and transfer of proven farming technology to the farmers. While this is considered critically important, the change could at best, be only gradually achieved. The approach taken was to focus initially on foundation investment such as training of trainers and a core research staff in critical areas such as seed multiplication or fish breeding centers where further training and learning by doing could follow within a short period of time. It is also decided to be selective in the programs and projects in the light of impact and results. Pilot schemes for reorganization and restructuring would be introduced in provinces and districts in order to assist in the transition to a decentralization process. In addition, the approach to be taken should at best be step by step so as not to cause heavy disruption to the existing framework. The overall program for institutional strengthening calls for strengthening of MAF's Departments of Planning and Personnel, the administration divisions and the Technical Departments. The emphasis is also on

PAFS and DAFO with a program of strengthening through recruitment and training.

Human Resource Development

- 8.4 The long-term objective is to provide MAF and line agencies with qualified administrative and technical staff that would be able to provide a professional support service through demonstration and advise to the farming community. In order to achieve this, the plan envisages that besides the major institutional and organizational reform, there should be a major long term effort of upgrading the skills of the staff at all levels. The program is for setting up the organizational framework for human resource development at the central level and to place increased emphasis at the provincial level. A provincial Extension Training Unit would be established and would coordinate the extension programs and coordinate the training requirements. This would also cater to the training needs of the districts. In addition, in-service training programs for DAFO staff as well as farmer training on agriculture and forestry would be a part of the program through the setting up of farmer vocational training schools. The Technicians Schools, the Irrigation Technician School, university education in agriculture and the expansion of agriculture and forestry education in primary and secondary schools is all part of the comprehensive program. It is proposed that the program is implemented in a step-by-step approach with priority given to training of district staff. In addition, it is recommended that donor assistance should be targeted to critical areas particularly of a foundation type, such as training of trainers.

Field Crops

- 8.5 This is the most important of the component of the Action Plan as it deals with the paddy sector that accounts for more than half of all agriculture value added. The objectives are separate for the flat land as distinct from the sloping lands as already outlined in the Strategic Vision. For the flat land, the major emphasis is on accelerating the market driven process through expansion of crop diversification through cash crops and livestock and fisheries and enhancement of crop yield.
- 8.6 For the flat lands there would be little need for development of new paddy land as the increased requirements could be met by yield increases. Yield increases would come through improved seed, strengthening extension services and better support services. In order to promote the diversification program, there is a need for research and adaptive research and programs should be in place for research trials for vegetable, fruit, and upland crops. Provision is therefore made in the Plan for adaptive research and promotion for commercial crop production, crop

diversification, horticulture, fruit crop and sustainable sugar cane cultivation. In addition, sericulture is also to be promoted mainly for the purpose of income supplementation for farm families.

- 8.7 For the sloping land, increasing paddy yields is an important consideration as these are paddy deficit areas and emergency storage measures are also important as these areas suffer from chronic shortages. Because of the widespread practice of shifting cultivation, the emphasis is on research and extension activities to convert shifting cultivation areas into permanent farmland by cropping patterns and cultivation technologies that are applicable to the major shifting cultivation regions.

Livestock and Fisheries

- 8.8 Small holders raise 90% of livestock and it is expected to remain so in Laos PDR. However, farming practices are traditional. The strategy is to increase the productivity through improvement of animal health and epidemic control, improvement of traditional feeding and management systems, effective use of lands, improvement of fodder crops and management of natural pasture lands and breed improvement programs. The strengthening of animal health programs is a priority and includes the establishment and implementation of laws and regulations on animal health, meat inspection and animal disease control, establishment of diagnostic laboratory facilities, and strengthening of animal quarantine facilities. The basic research on animal health needs to be strengthened through improvement of the National Livestock Center with the establishment of a Vaccine Quality Testing Laboratory and a Contagious Disease Laboratory. With the entry into ASEAN and the AFTA accession, there is increased potential for export of animals and animal products for which Lao PDR has a comparative advantage. It is also known that the unrecorded border trade in live cattle is very large. In order to exploit this export potential there is a case for an early implementation of the above measures.
- 8.9 Fish catch of the Mekong River is decreasing and aquaculture provides an alternative source of supply. Fish provides animal protein to the rural population, provides farmers with income generation opportunities and the potential exists for a measurable increase in production, as the technology is relatively easy to transfer to farmers. The objective of the aquaculture program is to increase incomes of farmers. There is a need to improve the culture technology and rehabilitation of the existing aquaculture facilities by improving the experimental seed production and aquaculture techniques and to extend selected seed
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technologies. The major approach in aquaculture is to be achieved by improvement in the survival rate of fingerling production and in transportation, use of correct water body and culture density, the rehabilitation of fish ponds and use of proper water depth, and supply of feed according to technical standards. Farmers have relatively easily accepted aquaculture and the rate of growth has been rapid. In order to address the technical constraints to increased production, several projects have been proposed for aquaculture development, fish station rehabilitation, and small scale breeding expansion, rural aquaculture development and fish feed technology.

Stabilization of Shifting Cultivation

- 8.10 The objective is to stabilize shifting cultivation in the upland areas through: (i) development of sustainable sedentary production activities that do not have adverse environmental effects; and (ii) expand sedentary livelihood systems in upland areas, through permanent use of allocated land as opposed to traditional extensive swidden rotation systems; and (iii) development and expansion of off-farm income generating activities. There is need for the development and adaptation of upland farming and livelihood systems at the village/community level. This would require appropriate land use planning, appropriate farming systems development including livestock and fisheries, development of sustainable management and utilization of NTFPs and development of off-farm income generating activities.
- 8.11 The programs proposed are for a continuation of the efforts to stabilize shifting cultivation in upland areas. These relate to an area-based approach, as the total programs tend to be very large. Additionally, the farming practices as alternatives may also differ based on different zones or areas. Proposals are made for stabilization of shifting cultivation within the NBCA areas and outside as well as programs for agro-forestry research/extension linkages, on-farm tree planting and a study on the sustainable management and production of NTFP

Marketing and Agro-processing

- 8.12 The major objective in both marketing and agro-processing is to provide for an enabling market environment so that producers, consumers and the agribusiness community could make decisions within the framework of the market economy. No provision is made in the Action Plan for public sector direct involvement in marketing or agro-processing activities but only as a facilitator and regulator. In agro-processing, the objective is to provide technical support and advise for improvement of quality and loss reduction in private sector processing facilities of
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agricultural products. The major strategy for the achievement of objectives for agricultural marketing would be through provision of better market access, market information services, removal of market distortions and provision of facilitation and regulatory services, when necessary in the interest of trade and market expansion. In the sloping lands there is a lack of market access and most farmers do not have access roads. In the short term, the strategy is to provide market access, in both domestic and foreign markets. The objective is to set up a system to provide market information on a regular basis so that producers, consumers and the agribusiness community would be better informed of market potential and opportunities.

- 8.13 In the longer term, the goal would be to provide facilitation and regulation necessary to reap economies of scale through grading, standardization and standardized packaging and conformity to international standards of hygiene and health as well as international freight standards. The objective would be to improve marketing of perishable commodities, facilitation of agro-processing and input marketing and exploiting the potential for increased market share in the production of goods and services in the Mekong Corridor area following conformity with AFTA guidelines for freer trade.
- 8.14 The strategy for agro-processing would be through provision of technical training, rural credit for purchase of equipment and establishment of facilities and formulation of group activity at community level. Those support services would be provided through various crop promotion programs as well as village led agricultural development initiative program. In addition, training for agro-processing activities will be made in farm vocational schools to be attached to Regional Agriculture and Forest Training Centers as well as Post Harvest and Agro-processing Technology Center

Rural Finance

- 8.15 The primary objective of the rural finance program is to make available institutional rural financial services to a large segment of the rural population. The objective is also to make existing financial institutions and new financial institutions cater to the needs of the farming population through new and innovative deposit mobilization mechanisms and loan products. The commercial banks are in a weak financial position, have limited expertise and staff. APB is best with financial problems and relies on government for about 80% of its lending annually. In the short term, it would be necessary to make the APB and

the commercial banks commercially viable institutions before they could be in a position to meet the needs of the farming community.

- 8.16 The strategy is to improve the overall efficiency of the existing financial institutions through restructuring and corporatisation and make them adopt commercial bank practices and solve the problems of non-performing loans. In the short to medium term this would mean improving the financial position of the banks, improving management and financial systems, credit risk evaluation procedures, appraisal of borrowers and cash flow analysis. There should also be a drastic change in APB policies and operations and elimination of government subsidies on credit. There should also be a training program for bank staff in commercial banking practices. In the longer term, there should be setting up of savings and credit groups through a evaluation of the on-going village revolving funds to transform the more viable, more efficient ones into savings and credit groups. A micro finance system to service the needs of rural families in competition with other banks also needs to be set up. The UNDP Micro Finance Project currently underway could be developed as a basic model with appropriate modifications.

Rural Development

- 8.17 Although over 80% of the population lives in rural areas, basic infrastructure facilities are not available for a large majority of the population. There is a pressing need for a expansion of rural development programs on the lines of the Focal Site Approach. The focal site approach has provided infrastructure facilities in order to alleviate poverty and improve the livelihood of the population. In case of potential areas for agricultural development a different emphasis is required which aims for fostering market-driven agriculture development. In this approach, priority would be given to feeder road construction. Other infrastructure facilities, that would also be provided on a needs basis, would include schools, health facilities, water supply etc. The programs will be carried out at the provincial level under a bottom up planning and implementation process. Weaknesses of the on-going focal site approach would be identified and rectification made in implementing this program. The selection of the areas would be made based on information related to land, water, human resources as well as other data from PAFS and DAFO. In the implementation of the rural development program with the following objectives, two programs are proposed; the Village Initiative Agriculture Development in Remote Rural Areas, and the Area Based Integrated Rural Development Program.

Irrigation

- 8.18 The objectives of the proposed Plan for the irrigation sub-sector are to: (i) ensure food security by productivity improvement under irrigated agriculture; (ii) generate cash income through introduction and promotion of crop diversification under irrigation; and (iii) assist the Water User's Association (WUA) through training, organizational strengthening and institutional set up under the IMT process. In accordance with the 1998 Decree of full transfer of Irrigation Projects to Community Organization, the IMT policy is being implemented nationwide. With the transfer of ownership is the associated cost to the farmers of the O&M . The progress of the IMT process is not without its problems largely a result of the low market price for rice and the deterioration of the existing irrigation facilities as well as lack of farmer response. The program for irrigation is therefore based on the rehabilitation of existing irrigation works in parallel with support to the WUA and support for the IMT process, effective utilization of water resources with introduction and promotion of high value crops and the protection of irrigation facilities at flood prone areas along the Mekong River.

9. The Action Plan

Action Plan Towards the Year 2020

- 9.1 The Action Plan was formulated against this backdrop taking into account the potential and constraints. A sub-sector approach was adopted in the formulation of projects and programs so as to facilitate identification of government agencies responsible for implementation. Ten sub-sectors were included 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. In total 110 projects were identified and the sector breakdown is as follows:

Summary of Proposed Programs and Projects

Sub-Sector	Nos. of Programs and Project
1. Land and Water Resource Development	9
2. Institutions and Organizations	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
Total	110

Note: 110 programs/projects include 6 sub-programs/sub-projects.

Sequencing for Commencement of Projects prior to 2010

9.2 There are several factors to be considered in dealing with such a large program over a twenty-year period. In addition, it is likely that there would be a resource constraint and therefore there is need for some sequencing and prioritization. The approach to sequencing is dependent on the primary objective of the Action Plan – to maximize value added. But there are other considerations such as effect on poverty alleviation, employment impact, supplementary income generation, impact on beneficiaries and the pace of moving out of subsistence farming. Other considerations such as the multiplier effects and the forward and backward linkages and effects on export trade were also considered. There was also need to examine the capacity of the agencies to undertake the programs; the level of skills and skill mix; the availability of funds for operation and maintenance and many other variables. Given all these considerations, the following criteria were adopted for sequencing of these 110 programs based on a point score method:

- Projects/programs directly impacting on value added (GDP).
- Projects/Programs that currently have the Provincial/District implementation capacity.
- Projects/programs that are low cost and quick yielding.
- Projects involving ‘foundation’ investment e.g training of trainers, foundation seed production, fish breeding stations etc.
- projects/programs to restore sub-sectoral balance and increase allocation for recurrent expenditure.

9.3 Based on the above criteria, a preliminary assessment was made and all projects were classified into three categories in terms of year of commencement namely projects to commence before 2010 and those that are to commence from 2011-2020. A third category comprising eight projects that were on-going was also added to the list as follows:

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. Institutions and Organizations	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
Total	110	8	58	44

10. Initial Environmental Screening for Priority Projects

10.1 An Environmental Screening for all the priority projects proposed in the Study is undertaken, highlighting whether projects or programs will require an IEE. Many of the proposals will result in positive environmental and social benefits or are neutral. Therefore, such initiatives will not require an IEE. However, these interventions still require a Certificate of Compliance before they can officially proceed. For new arable, pastoral and mixed farming projects or projects based on the exploitation of NTFPs, IEEs and EIAs could be required in various specific areas where projects are proposed in such areas of conservation forests, religious and historic significance, wetlands, etc.

11. Implementation Plan towards the Year 2010**Development Goals as a Basis for Prioritization**

11.1 Programs/projects would impact differently in terms of net impact on value added (GDP). The number of projects also may be too large in the light of the resource envelope. It was therefore decided to prioritize the 58 projects to be taken up before 2010. There were several criteria that could be used in prioritization but the main consideration was the overall goal of the Strategic Vision namely that of graduating from the group of LLDC by 2020. In the light of this goal, the primary indicator would be the net impact on value added. The Study revealed that the capacity of PAFS and DAFO was critical to the success of the Action Plan. In order to assess this aspect, a standard checklist and a point score system was prepared and each project was assessed on this basis.

11.2 While the net return is important it is not taken into account of the timing of returns due to the gestation period and to account for this the relative project costs

and the timing of returns was included as a criterion. In view of the long time horizon of the Action Plan it was necessary to also provide for a resource base of physical and human capital to ensure that the impact on value added is continued through the whole of the twenty-year period. These were referred to as foundation building investments. Examples of such activities are trainer training programs, foundation seed and seed multiplication, livestock disease control and fish seed production and research. A review of recent studies also shows that there was a sectoral imbalance in investments and some sub-sectors with potential did not receive adequate investment funds. These needed to be redressed and this was also taken as a criterion. Some programs needed to be implemented in unison with other programs in order to realize their full potential for example a vegetable promotion project should be undertaken along with a market information project. Project interdependency was also included as a criterion and employment creation and rural development impact.

- 11.3 A point score was assigned to each project that was to be taken up before 2010.

Project profiles giving basic data on objectives, strategy, description, project components and costs, and expected results was provided. The evaluation criteria and the scoring method for prioritization is set as shown in the right table.

Evaluating Scoring	
Evaluation Criteria	Score (1 to 5 points)
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 (≤ 3 in 1)	
6. Project to Project Interdependency	
7. Employment Creation/Rural development	
Total Score (Max. 35)	

Results of the Prioritization and Sequencing of Projects and Programs^{1/}

- 11.4 As the results of the prioritization, eleven projects are identified as the first priority group, mainly categorized 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 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 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

^{1/} Priority grouping of 58 programs and projects is given in Table 9.3 in the main report.

for Community Managed Small Scale Irrigation systems. The above three groups evaluated at larger than 60% scoring.

- 11.5 The next group of projects in order of priority, evaluated at smaller than 60%, is 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. A list of the priority grouping of the projects is in the attached table.

Financing of the Action Plan

- 11.6 It is assumed that future PIP allocations to agriculture would be increased by 18% per annum in current values. In addition, 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 projected as shown in the table below.

Agriculture Sector Investment Projection 2002/03 to 2009/10

unit: Billion Kip in constant terms

Description	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) (Billion Kip)	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

- 11.7 The budgetary resource availability was compared with the preliminary costs of the priority projects and programs to give a broad indication of the extent to which resources are likely to be available for the projects and programs. Based on the assumptions it appears that funds would be available for priority 1, priority 2 and priority 3 projects/programs. 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 22 of the listed 58 priority projects could be started in the first year.

- 11.8 However, as over 80% of the PIP for any year is met from donor assistance, it is likely that donors would select projects/programs from this priority list. Furthermore, 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, the 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.

12. Conclusion and Issues

Conclusion

- 12.1 The Study covered all aspects of agriculture development in Lao PDR. As a result, the Study presents 110 projects and programs, that includes eight on-going and committed projects for implementation, and 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 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.
- 12.2 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 donors' own guideline in assisting Lao PDR would also be taken into account in selection of these projects and programs.

Implementation Issues and Prerequisite

12.3 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 the 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.

(1) 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. However, there are some interventions that should be addressed to achieve immediate efficiency gains. It is recommended that the 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.

(2) Implementation Arrangements

The 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 shortage of trained and experienced manpower. 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 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.

(3) 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. It is 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. The Fund should receive monies from the sale of vaccines from the government factory,

monies from the sale of foundation seeds, sale of plant and fish fingerlings, sale of government livestock and other revenue generating operations. The Fund is only meant to supplement the government annual budgetary 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.

(4) Coordination of Donor Assisted Projects

Policies and procedures, especially in area development projects pursued in donor-assisted projects have not been uniform, for example that fertilizer was made available at different subsidized prices under different projects. This situation runs counter to pursuing a uniform government policy and at the same time gives wrong market signals. There is therefore a need to coordinate and to enforce guidelines to ensure that all donor assisted project components are in line with government policies and strategies.

(5) Need for Inter-Agency Coordination Mechanisms

Most of the projects and programs require concerted action on implementation from more than one government agency. It is essential that all these programs are synchronized and sequenced to ensure maximum impact. It is recommended in order to ensure this coordination that one Working Unit with several sub-units be set up above Ministry level.

(6) 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 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 Government's actions. The meeting should be held annually to highlight the progress under different projects and programs, the constraints and bottlenecks facing the program and a plan of action for the forthcoming year.

(7) MAF- Provincial Linkages

The link between MAF and the local government agencies in terms of implementation is weak following decentralization. While staff and administration at the local government level continue 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. It is recommended that the Planning Department of MAF step up its monitoring and evaluation activities and also

monitor financial and project achievement monitoring.

(8) Integration of the Public Investment Program (PIP) into Action Plan.

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. 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 review its draft five-year plan to ensure that the Action Plan is consistent with the five-year development plan.

(9) Public Administration Role in Action Plan

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 of government officials. 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. 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.

(10) 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.

**MASTER PLAN STUDY
ON
INTEGRATED AGRICULTURAL DEVELOPMENT
IN
LAO PEOPLE'S DEMOCRATIC REPUBLIC**

VOLUME I MAIN REPORT

Table of Contents

MAP OF LAO PDR	
ADMINISTRATIVE DATA	
PHOTOGRAPHS OF PRESENT AGRICULTURAL AND RURAL DEVELOPMENT IN LAO PDR	
SUMMARY	
	<u>Page</u>
Chapter 1 INTRODUCTION	1-1
1.1 General.....	1-1
1.2 Background and Objectives	1-1
1.2.1 Background of the Study.....	1-1
1.2.2 Objectives of the Study.....	1-3
1.3 Study Procedure and Work Progress.....	1-3
1.3.1 Study Procedure	1-3
1.3.2 Study Progress	1-5
1.3.3 Technology Transfer	1-7
1.3.4 Homepage of the Study.....	1-8
Chapter 2 SOCIO-ECONOMIC BACKGROUND.....	2-1
2.1 Socio-economic Development and Performance.....	2-1
2.1.1 Overview of Macro-economic Performance.....	2-1
2.1.2 National and External Financing.....	2-3
2.1.3 National Development Challenge	2-5
2.2 Socio-economic Development Strategy for 2010-2020 and Five-year Socio-economic Plan V (2001-2005).....	2-7
2.2.1 Basic Development Strategy towards 2010-2020.....	2-7
2.2.2 Fifth Five-year Socio-economic Development Plan (2001 - 2005)	2-8

	<u>Page</u>
2.3 Trade in Global Setting.....	2-11
2.4 National Administration Structure and Decentralization.....	2-14
2.5 Socio-economic Setting in Rural Area.....	2-18
2.5.1 Rural Social Structure.....	2-18
2.5.2 Consumption, Income and Employment in the Rural Sector.....	2-19
2.5.3 Some Key Social Indicators.....	2-20
2.6 Social Issue.....	2-21
2.6.1 Ethnicity.....	2-21
2.6.2 Gender Issues.....	2-22
2.6.3 Resettlement.....	2-24
2.6.4 Poverty Alleviation.....	2-25
Chapter 3 BACKGROUND AND CONSTRAINTS IN LAO AGRICULTURE.....	3-1
3.1 Policy and Strategy of Agricultural Development in Lao PDR.....	3-1
3.1.1 Overview of Agricultural Development and Performance.....	3-1
3.1.2 Government's Strategies for the Agriculture Sector.....	3-3
3.2 Present Conditions and Constraints in Lao Agriculture.....	3-5
3.2.1 Natural Resources and the Environment.....	3-5
3.2.2 Institutions and Organizations.....	3-9
3.2.3 Land Tenure.....	3-18
3.2.4 Human Resources Development.....	3-21
3.2.5 Crop.....	3-27
3.2.6 Livestock and Fisheries.....	3-37
3.2.7 Shifting Cultivation.....	3-41
3.2.8 Marketing and Agro-processing.....	3-47
3.2.9 Rural Finance.....	3-50
3.2.10 Rural Development.....	3-57
3.2.11 Irrigation.....	3-62
3.3 International Partnership in Agriculture and Rural Development.....	3-69
3.3.1 International Cooperation and Assistance.....	3-69
3.3.2 Roles of NGOs in Agriculture and Rural Development.....	3-73
3.4 Past and Current Agriculture Development Activities.....	3-75
3.4.1 Agriculture Development Project under MAF.....	3-75
3.4.2 Lessons Learned from Past Donor-Assisted Projects.....	3-76

	<u>Page</u>
Chapter 4	ASSESSMENT OF AGRICULTURAL SETTING AND DEVELOPMENT POTENTIAL
4.1	Assessment of Agricultural Setting..... 4-1
4.1.1	Method of Assessment..... 4-1
4.1.2	Grouping of Districts 4-6
4.2	Assessment of Agriculture Potential..... 4-13
4.2.1	Method of Assessment..... 4-13
4.2.2	Outputs of Assessment for Agriculture Potential..... 4-16
4.3	Availability of Potentially New Agricultural Land and Priority Ranking for Removal of UXOs 4-21
Chapter 5	BASIC CONCEPT AND APPROACH FOR ACTION PLAN 5-1
5.1	Development Objectives and Strategy for Action Plan..... 5-1
5.2	Market Economy..... 5-2
5.3	Framework of Agricultural Development..... 5-4
5.3.1	Demographic Framework 5-4
5.3.2	Macroeconomic Framework 5-5
5.3.3	Policy Framework..... 5-9
5.3.4	Role of the Private Sector in Action Plan..... 5-10
5.4	Approach to Program/Project in Action Plan.....5-11
5.5	Area Based Agricultural and Rural Development 5-16
5.5.1	Introduction..... 5-16
5.5.2	Northern Upland and Highland Areas 5-16
5.5.3	Vientiane Plain..... 5-18
5.5.4	Central and Southern Areas 5-19
5.5.5	Boloven Plateau..... 5-21
Chapter 6	OBJECTIVE AND STRATEGY FOR SUB-SECTOR BASED AGRICULTURAL DEVELOPMENT
6.1	Introduction..... 6-1
6.2	Land and Water Resource Development..... 6-1
6.3	Institution and Organization..... 6-7
6.4	Human Resource Development6-11
6.5	Field Crops..... 6-17
6.6	Livestock and Fisheries..... 6-24

	<u>Page</u>
6.6.1 Livestock.....	6-24
6.6.2 Fisheries.....	6-29
6.7 Stabilization of Shifting Cultivation through Agro-forestry, NTFPs and Related Livelihood Activities.....	6-32
6.8 Marketing and Agro-processing.....	6-38
6.9 Rural Finance.....	6-42
6.10 Rural Development.....	6-45
6.11 Irrigation.....	6-49
 Chapter 7 ACTION PLAN FOR INTEGRATED AGRICULTURAL DEVELOPMENT	
7.1 Action Plan towards the Year 2020 for Integrated Agriculture Development.....	7-1
7.2 Selection of Programs and Projects for Implementation before 2010.....	7-30
7.2.1 Approach to Sequencing.....	7-30
7.2.2 Assessment for Sequencing.....	7-31
 Chapter 8 ENVIRONMENTAL ASSESSMENT	
8.1 Environmental Laws and Regulations.....	8-1
8.2 Initial Environmental Screening for Priority Projects.....	8-7
 Chapter 9 IMPLEMENTATION PLAN TOWARDS YEAR 2010	
9.1 Development Goal as a Basis for Prioritization.....	9-1
9.2 Results of the Prioritization and Sequencing of Projects and Programs.....	9-4
9.2.1 Introduction.....	9-4
9.2.2 Result of Priority by Scoring Evaluation.....	9-4
9.2.3 Prioritization on Area-based Agricultural and Rural Development Approach.....	9-9
9.2.4 Prioritization on Sub-sector-based Approach.....	9-9
9.3 Financing of the Action Plan.....	9-13
 Chapter 10 CONCLUSION AND ISSUES	
10.1 Conclusion.....	10-1
10.2 Implementation Issues and Prerequisite.....	10-2
10.2.1 Introduction.....	10-2
10.2.2 Policy Actions.....	10-2

	<u>Page</u>
10.2.3	Implementation Arrangements..... 10-2
10.2.4	Recurrent Expenditure Fund 10-3
10.2.5	Coordination of Donor Assisted Projects 10-4
10.2.6	Need for Inter-Agency Coordination Mechanisms..... 10-4
10.2.7	Annual Meeting for Progress and Reporting to Donors 10-5
10.2.8	MAF- Provincial Linkages 10-5
10.2.9	Integration of the Public Investment Program (PIP) into Action Plan..... 10-6
10.2.10	Public Administration Role in Action Plan..... 10-6
10.2.11	Project Formulation and Cost Estimation..... 10-7

List of Tables

	<u>Page</u>
Table 1.1	Name List of JICA Study Team Personnel and MAF Counterpart Personnel..... 1-8
Table 2.1	Comparative Real GDP Growth Rates.....2-2
Table 2.2	Economic and Financial Indicators 1992 - 2000 of Lao PDR.....2-3
Table 2.3	1996-99 General Government Budget (Billion Kip).....2-4
Table 2.4	Total Donor Commitments to Foreign Cooperation Projects in Agriculture.....2-4
Table 2.5	Summary of PIP Actual Implementation 1996-2000.....2-4
Table 2.6	Summary of Tariff Ranges by Major Groups..... 2-11
Table 2.7	Preferential Market Entry Opportunities in Thailand for Lao PDR.....2-14
Table 2.8	Share in percent of total consumption by area 1997/19982-19
Table 2.9	Adults Time Use on Income Generating Activities in Rural Area.....2-20
Table 2.10	Key Social Indicators2-21
Table 2.11	Percentage of Poor by Regions and Provinces- 1992-93 and 1997-98..2-26
Table 2.12	Incidence of Poverty by Regions and Rural and Urban Areas.....2-26
Table 3.1	Gross Domestic Product 19993-1
Table 3.2	Agriculture Sub-Sector Growth Rates – 1994-99 in 1999 Prices.....3-2
Table 3.3	Specific Development Initiatives for Flatland and Sloping Land3-5
Table 3.4	Agricultural Land Use in 1982 and 19893-7
Table 3.5	Functions of Departments and Institution of MAF 3-11
Table 3.6	MAF Personnel Education Distribution.....3-22

	<u>Page</u>
Table 3.7	PAFS Staff Allocation by Region.....3-22
Table 3.8	DAFO Staff Allocation by Region.....3-22
Table 3.9	Training Facilities under MAF3-26
Table 3.10	Summary of AEZ in LAO PDR3-27
Table 3.11	Area Holdings by Land Use.....3-27
Table 3.12	Harvested Area, Yield and Production of Major Crops on Average from 1996 to 20003-29
Table 3.13	Percentage of Farm Households Using Improved Seeds, Fertilizer, Pesticides, and Machinery.....3-30
Table 3.14	Paddy Balance Projection.....3-34
Table 3.15	Preliminary Projection on Paddy/Rice Balance for 2010 and 2020.....3-35
Table 3.16	Estimated Livestock Population 1996 - 20003-37
Table 3.17	Land-use by Region – Lao PDR.....3-43
Table 3.18	Regional Variation of Farm Gate Price in 19993-48
Table 3.19	Amount of Agriculture Processing Products.....3-49
Table 3.20	Coverage of APB Activities3-55
Table 3.21	APB Annual Collections3-56
Table 3.22	Summary List of Focal Sites3-59
Table 3.23	Irrigation Area.....3-63
Table 3.24	Regional Distribution of Existing Irrigation Schemes and Types3-63
Table 3.25	Unit Rate and Division of VDF.....3-65
Table 3.26	Flood Area and Loss in 2000.....3-67
Table 3.27	Loan and Grant Expressed in RTM73-71
Table 3.28	Fertilizer and Agricultural Machinery Provided in Year 2000.....3-73
Table 3.29	Amount of the NGO assistance by sector and its share in19973-74
Table 3.30	Past and Current Agriculture Development Projects by Responsible Department.....3-76
Table 4.1	Data Used in Assessment4-2
Table 4.2	Agricultural Setting in Lao PDR by Group of Districts4-7
Table 4.3	GIS Data Used for the Agriculture Potential Assessment4-13
Table 4.4	Criteria of Identification of Potential Area by Crop Groups.....4-15
Table 4.5	UXO Risk Category.....4-15
Table 4.6	Extent of Agriculture Potential Area for Each Crop Group and Grazing Land4-16

	<u>Page</u>
Table 4.7	Extent of UXO Risk Area.....4-16
Table 4.8	Districts with Higher Population Pressure for Agricultural Land4-24
Table 5.1	Assessment of Population Growth.....5-4
Table 5.2	Rural, Urban and Total Population Projection to 20205-4
Table 5.3	Projection of Relative Share of Urban-Rural Population.....5-4
Table 5.4	Scenario 1: GDP Projection by Main Sectors5-6
Table 5.5	Scenario 2: GDP Projections by Main Sectors to Reach US\$ 885/year by 20205-7
Table 5.6	Estimated Resource Availability for the Action Plan for Agriculture 2000-20205-8
Table 5.7	Actual and Planned PIP Total and Agriculture 1995/96 - 2002/20035-8
Table 5.8	Required PIP for Agriculture for Achievement of Target of \$ 885: Annual Target Agriculture PIP from 2002-2010 (excluding forestry)5-8
Table 6.1	Target Area, Yield and Production of Lowland and Dry Season Paddy.....6-23
Table 6.2	Target Area, Yield and Production of Upland Paddy.....6-23
Table 6.3	Livestock Development Target in 2020.....6-24
Table 6.4	Fish Production and Rate of Increase.....6-29
Table 7.1	Summary of Proposed Programs and Projects7-1
Table 7.2	Sequence of Proposed Programs and Projects.....7-32
Table 8.1	Environmental Screening for all Priority Projects.....8-7
Table 9.1	Evaluation Criteria and Scoring for Implementing Capacity.....9-2
Table 9.2	Evaluation Criteria and Scoring for Prioritization.....9-3
Table 9.3	Prioritization of Projects/Programs in Action Plan.....9-8
Table 9.4	Priority Projects and Programs by Area9-10
Table 9.5	Priority Projects and Programs by Sub-Sectors.....9-12
Table 9.6	MAF Budget Data (Actual 1995-96 to 1999-2000) and Planned 2001-20029-13
Table 9.7	Actual and Planned PIP Total and Agriculture 1995/96 to 2002/2003 ..9-13
Table 9.8	Agriculture Sector Investment Projection 2002/03 to 2009/10.....9-14
Table 9.9	Annual Capital and Recurrent Costs of Priority Projects.....9-16

List of Figures

	<u>Page</u>
Figure 1.1	Procedure of Master Plan Study on Integrated Agricultural Development in Lao PDR..... 1-7
Figure 2.1	Fluctuation of Major SE Asian Countries to US\$..... 2-1
Figure 3.1	Organizational Structure of the Ministry of Agriculture and Forestry... 3-10
Figure 3.2	NAFRI Organization Chart..... 3-31
Figure 3.3	Marketing of Nam Ngum Lake Fish..... 3-48
Figure 3.4	Condition of Rural Road 3-60
Figure 3.5	Location of Irrigation Scheme 3-64
Figure 3.6	Flood Prone Areas along the Mekong River 3-68
Figure 4.1	Grouping of Districts..... 4-11
Figure 4.2	Radar Chart of each Group 4-12
Figure 4.3	Potential or Lowland Rice 4-17
Figure 4.4	Potential for Upland crops..... 4-18
Figure 4.5	Potential for Tree Crops 4-19
Figure 4.6	Potential for Grazing Land 4-20
Figure 4.7	Average Size of New Agricultural Potential Area per Farm Household..... 4-22
Figure 4.8	UXO Risk Evaluation..... 4-23
Figure 5.1	Area Based Development 5-23

List of Attachments

Attachment 1	Summary of Agricultural Setting and Development Potential
Attachment 2	List of Proposed Programs and Projects

Currency Equivalent
(As of 29th December 2000)
US\$ 1.00 = Kip 8,220 = ¥ 114

Fiscal Year of Lao PDR
October 1 - September 30

ABBREVIATIONS

ACG	:	Agricultural Credit Group
ADB	:	Asian Development Bank
AEA	:	Agricultural Extension Agency, MAF
AEZ	:	Agro-ecological Zone
AFTA	:	ASEAN Free Trade Area
APB	:	Agricultural Promotion Bank
APG	:	Agricultural Production Group
ASEAN	:	Association of South East Asian Nations
AUSAID	:	Australian Agency for International Development
BCEL	:	Banque Commerciale pour Exterior de Laos
BOL	:	Bank of Lao PDR
CEPT	:	Common Effective Preferential Tariff
CPC	:	Committee for Planning and Cooperation
CPI	:	Consumer Price Index
CIF	:	Cost, Insurance and Freight
CLRDC	:	Central Leading Rural Development Committee
DAA	:	District Administration Authority
DOA	:	Department of Agriculture
DAFO	:	District Agriculture and Forestry Office
DCTPC	:	Department of Communication, Transport, Post and Construction
DOI	:	Department of Irrigation
DOLF	:	Department of Livestock and Fisheries
DMH	:	Department of Meteorology and Hydrology
EDL	:	Electricite du Laos
EIA	:	Environmental Impact Assessment
FAO	:	Food and Agriculture Organization
FDI	:	Foreign Direct Investment
FESW	:	Farming System Extension Worker
FIAT	:	Farmers Irrigated Agriculture Training Project
F/S	:	Feasibility Study
FOB	:	Free on Board
FSC	:	Food Supply Company
GDP	:	Gross Domestic Product
GEL	:	General Exemption List/CEPT
GIS	:	Geographic Information System
GMS	:	Greater Mekong Sub-region
GNP	:	Gross National Product
GOL	:	Government of Lao PDR or expressed as “the Government”
HRD	:	Human Resources Development
HYV	:	High Yielding Variety
IBRD	:	International Bank for Reconstruction and Development (WB)
IDA	:	International Development Association
IEE	:	Initial Environmental Examination
IL	:	Inclusion List/CEPT
ILO	:	International Labor Organization
IMF	:	International Monetary Fund
IMR	:	Infant Mortality Rate
IMT	:	Irrigation Management Transfer
IPM	:	Integrated Pest Management

IRRI	:	International Rice Research Institute
ISF	:	Irrigation Service Fee
JICA	:	Japan International Cooperation Agency
KR-II	:	Kennedy Round II
Lao PDR	:	Lao People's Democratic Republic
Lao-IRRI	:	Lao-International Rice Research Institute
LECS	:	Lao Expenditure and Consumption Survey
LLDC	:	Least Development Country
LNFC	:	Lao Front for National Construction
LSFP	:	Lao-Swedish Forestry Program
LWU	:	Lao Women Union
LYRU	:	Lao Youth Revolutionary Union
MAF	:	Ministry of Agriculture and Forestry
MCTPC	:	Ministry of Communication Transport Post and Construction
M/M	:	Minutes of Meeting
M/P	:	Master Plan
MOF	:	Ministry of Finance
MOIH	:	Ministry of Industry and Handicraft
NAFES	:	National Agriculture and Forestry Extension Services
NAFRI	:	National Agriculture and Forestry Research Institute
NBCA	:	National Biodiversity Conservation Area
NEM	:	New Economic Mechanism
NGO	:	Non-Governmental Organization
NRRP	:	National Rice Research Program
NT2	:	Nam Theun 2 (Hydropower Project)
NUOL	:	National University of Laos
ODA	:	Official Development Assistance
OJT	:	On-the Job Training
O&M	:	Operations and Maintenance
OPEC	:	Organization of Petroleum Exporting Countries
PAFS	:	Provincial Agriculture and Forestry Services
PIP	:	Public Investment Plan / Program
PIS	:	Provincial Irrigation Section
PMO	:	Prime Minister's Office
SEDP	:	Socio-Economic Development Plan
SIDA	:	Swedish International Development Authority
SIRAP	:	Sustainable Irrigated Agriculture Project
SL	:	Sensitive List/CEPT
SMS	:	Subject Matter Specialist
SOCB	:	State-Owned Commercial Bank
SOE	:	State-Owned Enterprise
SPC	:	State Planning Committee
STEA	:	Science, Technology and Environmental Agency
Strategic Vision	:	The Government's Strategic Vision for the Agricultural Sector
S/W	:	Scope of Works
TA	:	Technical Assistance
TEL	:	Temporary Exclusion List/CEPT
TOT	:	Trainer of Training
UNCDF	:	United Nations Capital Development Fund
UNDCP	:	United Nations Drug Control Programme
UNDP	:	United Nations Development Programme
UXO	:	Unexploded Ordnance
UXO LAO	:	Lao National UXO Programme
VARDP	:	Vientiane Agricultural and Rural Development Project
VDF	:	Village Development Fund (under IMT)
Vision 2020	:	Vision on Agricultural-Forestry Development until Year 2020
VVW	:	Village Veterinary Worker
WB	:	World Bank (see IBRD)
WTO	:	World Trade Organization
WUA/ WUG	:	Water Users Association/ Water Users Group

MEASUREMENT UNITS

Extent

cm^2 = Square-centimeter (1.0 cm x 1.0 cm)
 m^2 = Square-meter (1.0 m x 1.0 m)
 km^2 = Square-kilometers (1.0 Km x 1.0 Km)
a. = Acre or Acres (100 m^2 or 0.1 ha.)
ha. = Hectare (10,000 m^2)
ac = Acre (4,046.8 m^2 or 0.40468 ha.)

Length

mm = Millimeters
cm = Centimeters (cm = 10 mm)
m = Meters (m = 100 cm)
km = Kilometers (Km = 1,000 m)

Currency

US\$ = United State Dollars
US\$1.0 = J¥114 = Kip.8,220
(as of 29th December 2000)
J¥ = Japanese Yen
Kip = Laotian Kip

Volume

cm^3 = Cubic-centimeter
(1.0 cm x 1.0 cm x 1.0 cm or
1.0 m-lit.)
 m^3 = Cubic-meter
(1.0 m x 1.0 m x 1.0 m or
1.0 k-lit.)
lit. = Liter (1,000 cm^3)
MCM= Million Cubic Meter

Weight

gr. = Grams
Kg = Kilograms (1,000 gr.)
ton = Metric tonne (1,000 Kg)

Time

sec. = Seconds
min. = Minutes (60 sec.)
hr. = Hours (60 min.)